Chemical Week

January 21, 1956

Price 35 cents

Chemical executive talent: it's time to face the problem of adequate reserves . . . . . p. 37

It's a trend: more union contracts that provide pay for time not worked . . . . . p. 14

'Long-hair' experts can help plenty in finding tomorrow's technology bandwagons . . p. 22

In Singapore or Paris, chemical customers respond best to home-style service . . . . . p. 59

For chemicals from lignite, the Australians are turning to Lurgi gasification . . . . . p. 64

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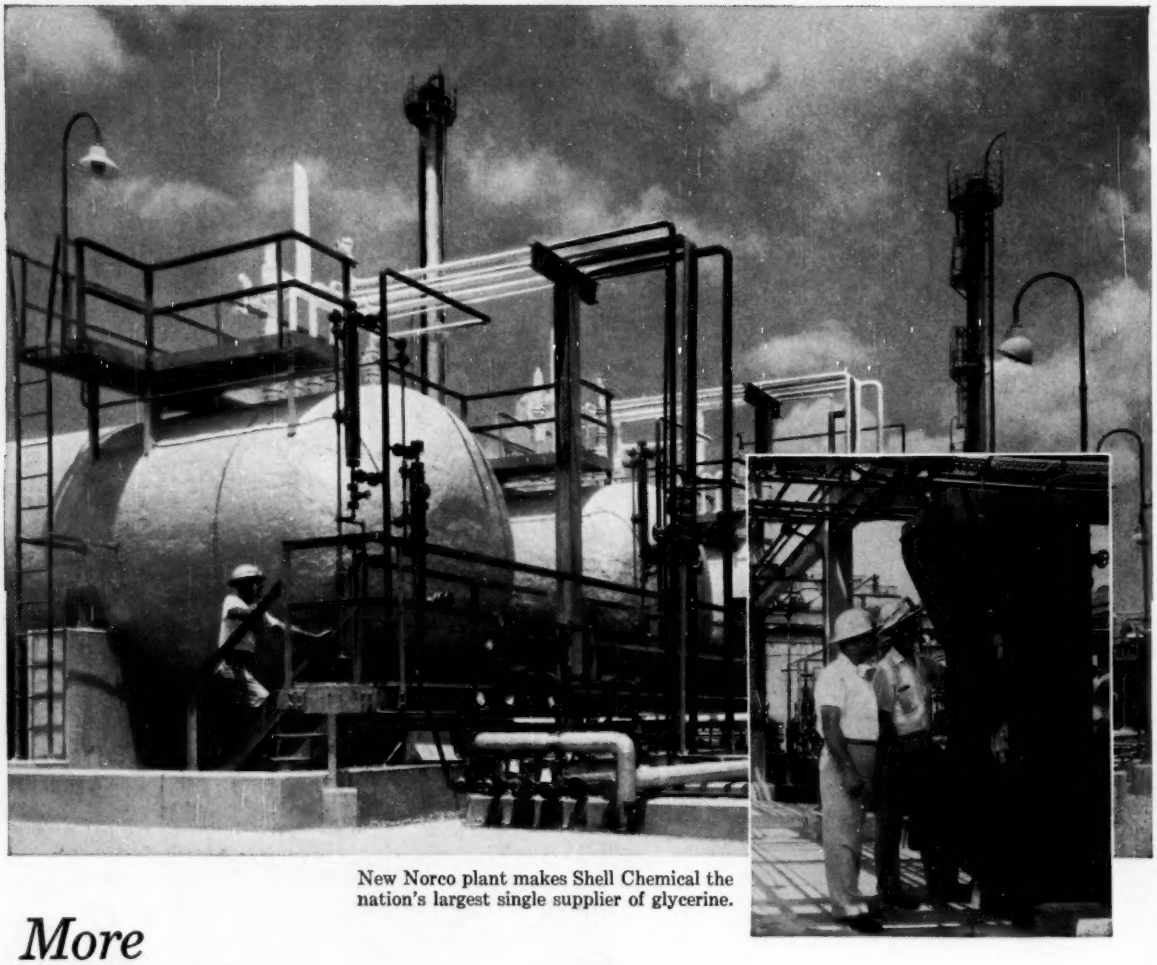

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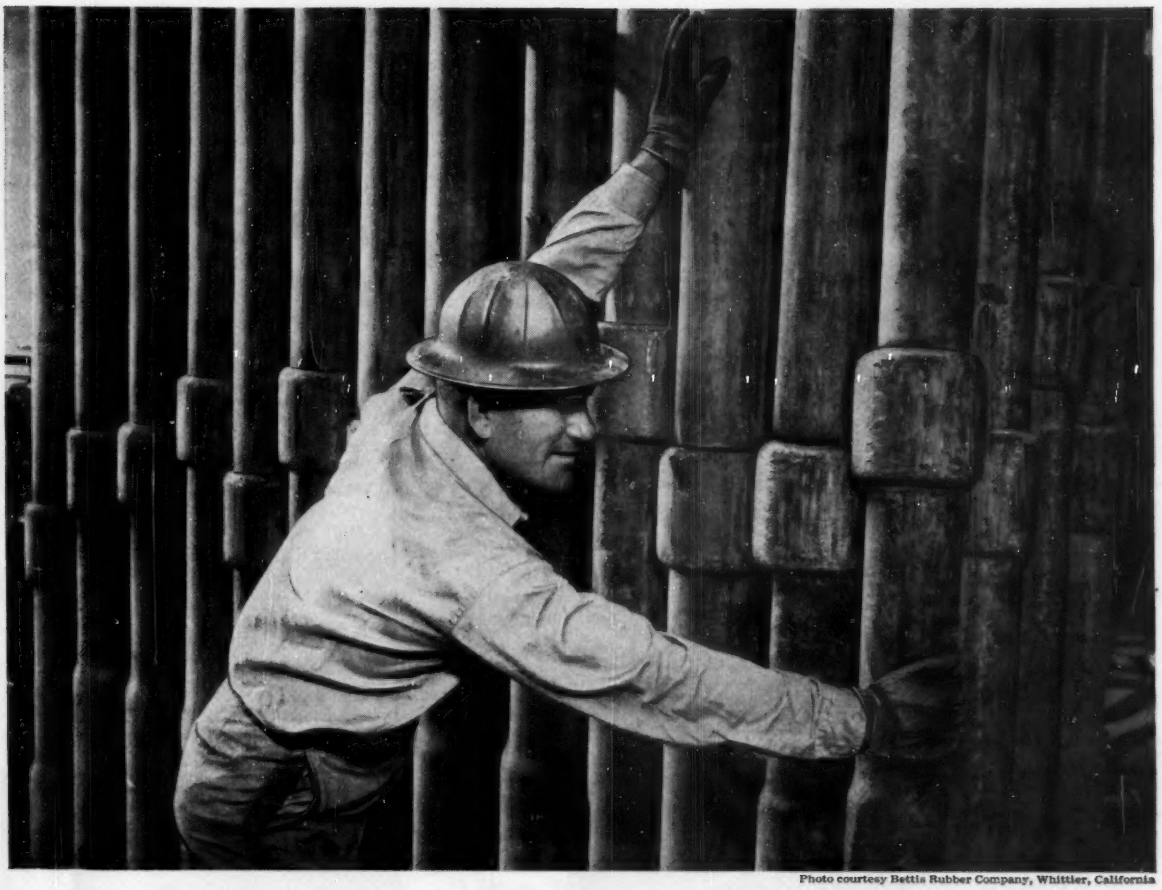

Photo courtesy Bettis Rubber Company, Whittier, California

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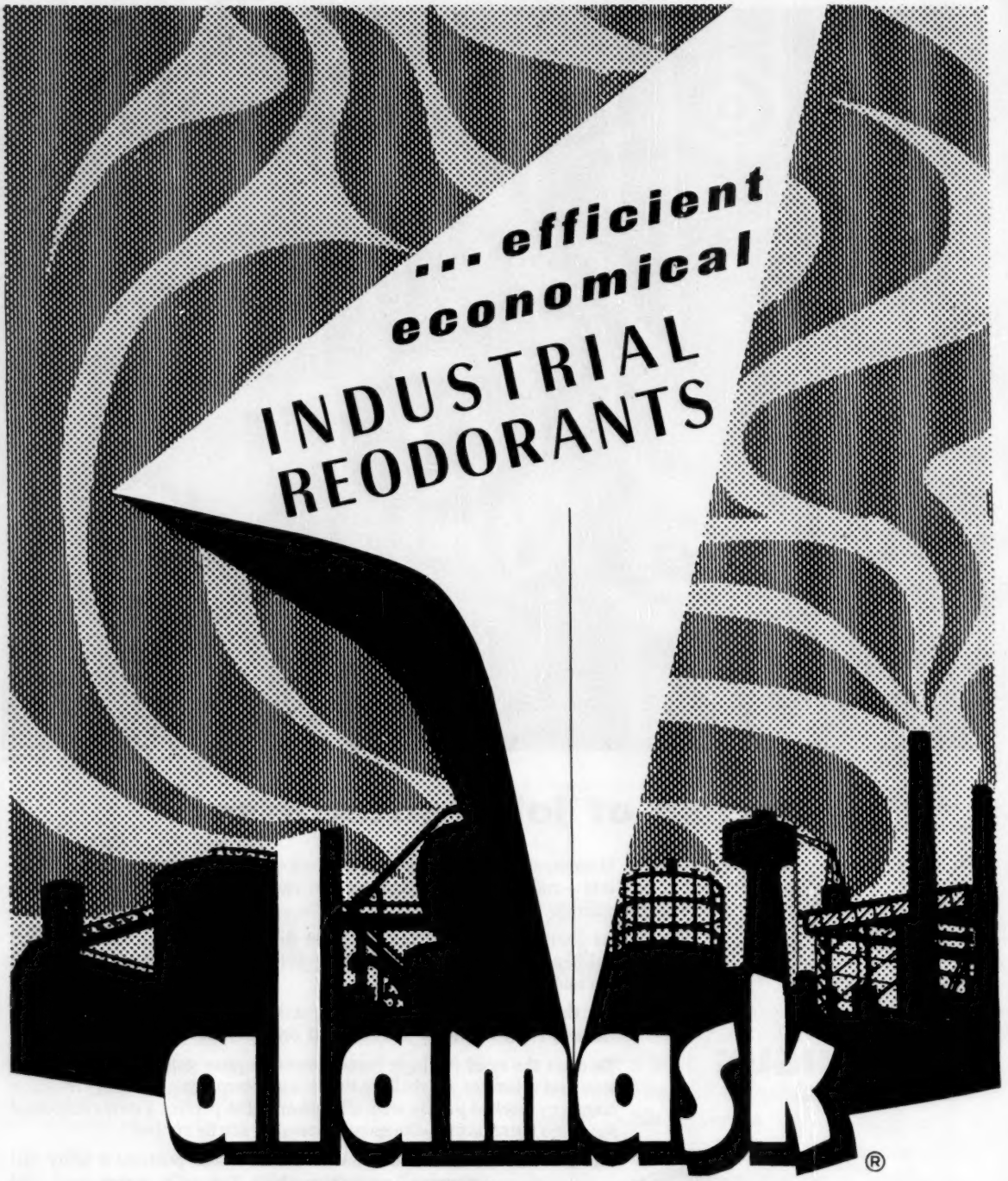

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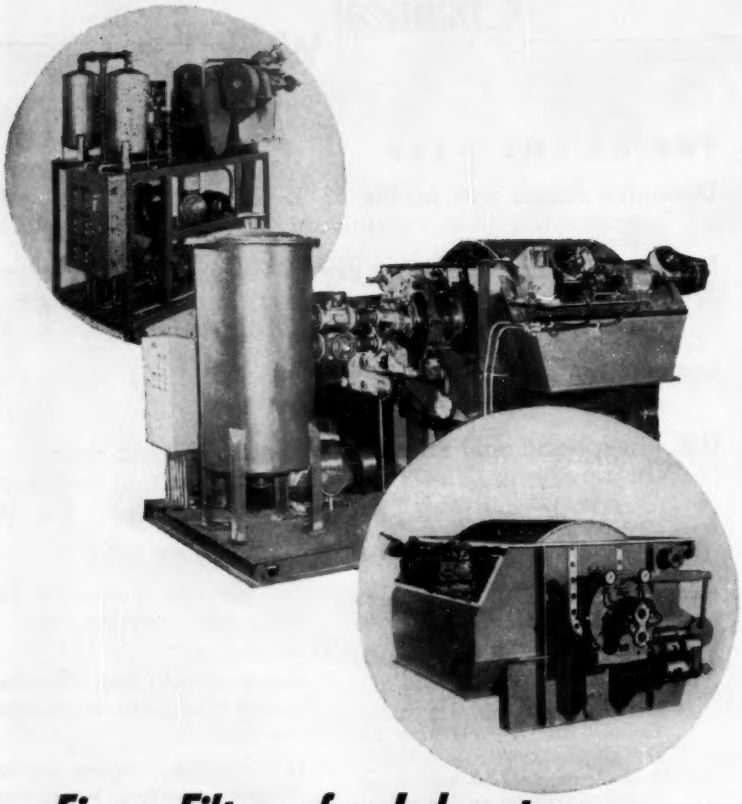

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OPINION....

Formaldehyde Realism

TO THE EDITOR: Due to the rush of the holiday season, we did not have an opportunity before this to write to you to tell you how much we enjoyed your recent article on formaldehyde. Over a period of years, there have been many articles written by publications on this subject, and we were happy to find that, from the viewpoint of one very much in this business, your article was more realistic than any others we have come across. . . .

E. J. SULLIVAN
New York

Conscientious Culling

TO THE EDITOR: The skillful manner in which excerpts from our annual report were woven into your story, "Plants Under Scrutiny" (*Dec. 17*), not only pleased me, but also provided further enthusiasm for the type of reporting that distinguishes your magazine. As a former editor I can appreciate that the writer of your story conscientiously culled our report and expertly selected those portions that were pertinent to the interests of your readers. May I extend congratulations. . . .

EDWARD J. CLEARY
Executive Director
and Chief Engineer
Ohio River Valley Water Sanitation Commission
Cincinnati, O.

Paving Warning

TO THE EDITOR: . . . CHEMICAL WEEK published (*Nov. 12, '55*) the statement that . . . a rubber pavement at a railroad crossing was going to be installed . . .

For 30 years, up until my retirement about three years ago, I was engineer of bridge maintenance for the city of Chicago, in charge of main-

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: H. C. E. Johnson, Chemical Week, 330 W. 42nd St., New York 36, N.Y.

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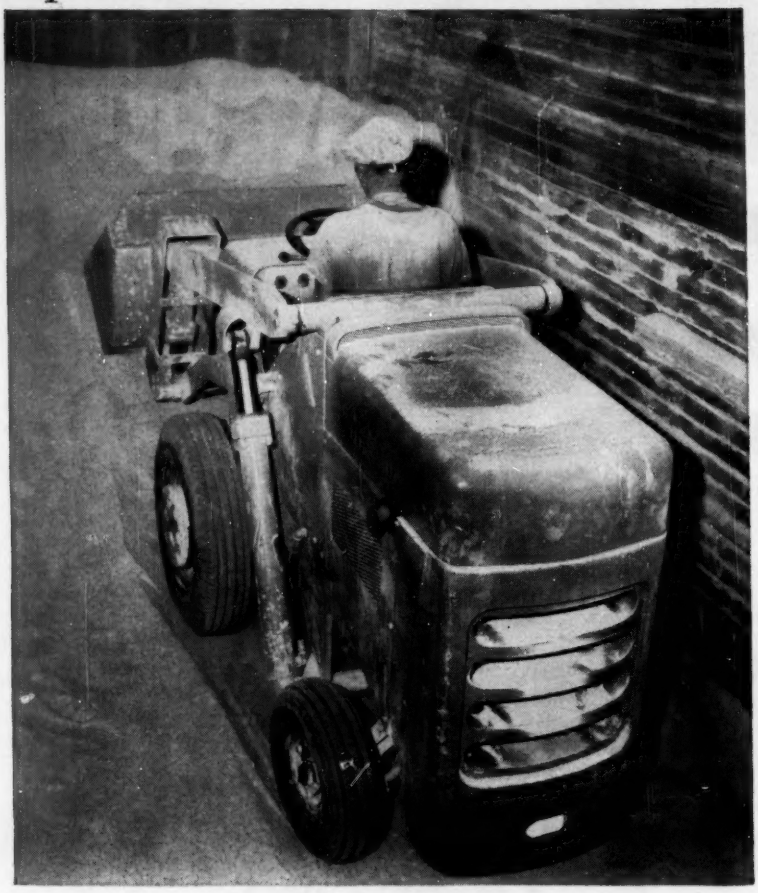
Report on the new **MICHIGAN 12B**



Power-shifting makes this new tractor shovel

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tenance and reconstruction of approximately $100 million worth of bridges, mostly of the movable bascule type, and have had much experience with many kinds of pavements.

About 32 years ago, as near as I recall, my predecessor and I (as his assistant then) installed a rubber pavement (about 8,000 square ft.) on the upper (boulevard) level of the Michigan Ave. Bridge. It proved to be dangerous, many accidents resulting, and consequently was never used on any other structure.

I am writing this to prevent possible loss or injury to life, as well as financial loss to interested parties. And if these latter feel I can be of service to them in this matter, I shall be pleased to cooperate further.

OTTO W. HANSEN
Altadena, Calif.

Doubly Clean Hair

TO THE EDITOR: That girl must have clean hair by now! She's washing it for Glyco on page 65 of the issue of Jan. 7 and for Cyanamid on page 70.

GEORGE L. BUC
Fisher Scientific Co.
Pittsburgh, Pa.

We notice that a retouch artist was also involved.—ED.

SEE YOU THERE

Plant Maintenance & Engineering Show, Convention Hall, Philadelphia, Jan. 23-26.

International Astronomical Society, annual meeting, including sessions on rocket propulsion, Hotel Astor, New York, Jan. 23-26.

National Water Resources Conference, Chamber of Commerce of the U.S., St Louis, Jan. 24-25.

Assn. of American Soap and Glycerine Producers, annual convention, Waldorf-Astoria, New York, Jan. 25-27.

American Society for Engineering Education, College-Industry Conference of Relations with Industry Division, Marquette University, Milwaukee, Jan. 26.

Chemical Market Research Assn. aromatic chemicals meeting, Webster Hall, Pittsburgh, Jan. 31-Feb. 1.

American Coke & Coal Chemicals Institute, Western regional meeting, Drake Hotel, Chicago, Feb. 2.

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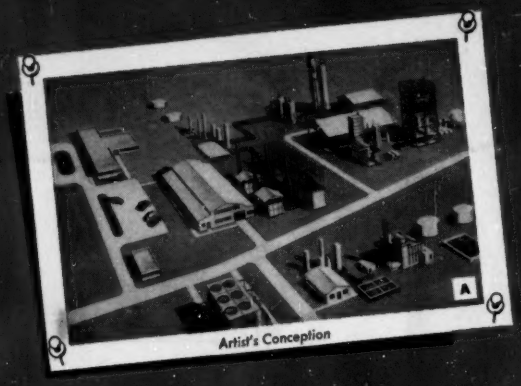

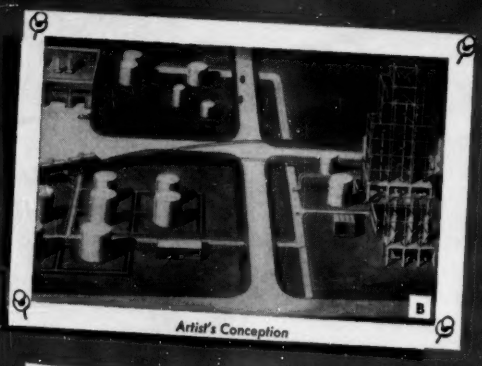

CURRENT CHEMICAL PROJECTS

Shown above are just a few of the current Lummus chemical projects.

A Lummus-designed anhydrous ammonia, sulfuric acid and ammonium sulfate plant under construction for Gonzalez Chemical Industries, Inc., at Guanica, Puerto Rico.

B 30,000,000 lb/yr vinyl acetate plant engineered and constructed by Lummus for Air Reduction Chemical Company to come on stream at Calvert City in early 1956.

C First commercial installation in this country for manufacture of high pressure acetylene derivatives engineered and constructed by Lummus for General Aniline & Film Corporation to begin operations at Calvert City in late 1955.

D Phenol-Acetone plant designed, engineered and constructed for Progil-Electrochimie at Pont de Claix, France in 1955.

Think of Lummus when planning your next plant.

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OTHER CURRENT LUMMUS CHEMICAL PROJECTS

1. 60-ton/day anhydrous ammonia plant being engineered and constructed for Westvaco Chemical Division, Food Machinery & Chemical Corporation.
2. Carthage Hydrocol, now owned by Stanolind Oil & Gas Co., being redesigned and reconstructed by Lummus for manufacture of synthetic fuel and chemical raw materials from natural gas.
3. Phthalic anhydride plant for Pittsburgh Coke & Chemical Company to be built at Neville Island, Pa.
4. Lummus-designed ammonia plant for St. Paul Ammonia Products, Inc., to be built at Pine Bend, Minnesota.
5. Epon Resin units for Shell Chemical Corporation at Houston, Texas.
6. Bisphenol unit for Shell Chemical Corporation at Houston, Texas.
7. Tetramer, Cumene and Phenol-Acetone units for Societe des Chimiques des Derives du Petrole at Antwerp, Belgium.
8. Sulfuric Acid plant for Inland Chemicals Canada Limited at Fort Saskatchewan, Alberta.

Business

Newsletter

CHEMICAL WEEK
January 21, 1956

New hydroelectric cutbacks this week by the Tennessee Valley Authority underscore chemical producer dependence on power supplies. Cutbacks in production are following in a wide spectrum of electrochemical plants.

Monsanto has been forced to slash elemental phosphorus production at Columbia, Tenn. This will reduce output of phosphorus-derived materials at several other plants.

National Carbide has had to trim its Calvert City, Ky., calcium carbide production by over 60%. This affects B. F. Goodrich acrylonitrile, N-type rubber and vinyl resins plants at Calvert City and Louisville, Ky., and at Avon Lake and Akron, O. Also, Airco Chemical, slated to open a $6-million vinyl acetate plant at Calvert City Feb. 1, may not be able to meet its target date unless carbide production gets back to normal.

A near drought in the Tennessee Valley is the cause of the cutbacks. Where TVA normally replenishes water supplies during the winter months, less than an inch of rain has fallen in the past five weeks. But though hydropower production is about half of normal, TVA steam-power production is up. The agency is reactivating four stand-by steam facilities, which will make up a third of the shortage.

•

But while such current news is bleak, a past record is impressive. Dow Chemical's profit for the six months ending Nov. 30 was up 71% over the same period of 1954, on sales that were up 23%. Comparison of the September-November quarters is even more striking—earnings were doubled on a 27% sales rise.

•

Harshaw Chemical, whose stock is sold over the counter, will ask that its shares be traded on the New York Stock Exchange. Decision to ask "Big Board" listing followed approval of a 2-for-1 stock split (*see p. 16*).

•

A merger is ahead for Warner-Lambert Pharmaceutical and Emerson Drug. Directors last week approved the merger, subject to stockholder approval in March.

•

Major paint companies are getting into the aerosol paint business. Du Pont already has the self-spray paints available on a limited sale basis, and now the Sherwin-Williams affiliate, Martin-Senour Co., will begin marketing them. First emphasis: as primers, rather than finish coats.

•

Polyethylene expansion again highlights the new-plant news. It's firm, now, that Celanese will erect a 30-million-lbs./year plant to make Phillips-type material. Location has as yet not been decided.

While Grace Chemical is as yet unsure of its polyethylene plant location, corporate parent W. R. Grace & Co. will enter the field on its own account. The company, jointly with Farbwerke Hoechst, will erect such a plant in Brazil. Both will use the Phillips process.

Elsewhere on the expansion front, Allied Chemical's Solvay Division has begun operation of its nonelectrolytic hydrogen peroxide plant, under construction for the past 18 months at Syracuse, N.Y.

The Texas Co. has picked Lockport, Ill., as the site of its projected anhydrous ammonia and ammonia-derivative plant. The 180-tons/day plant will use by-product hydrogen from nearby refinery operations.

General Tire & Rubber plans a 50% expansion of its Ashtabula, O., polyvinyl chloride resin plant. Total cost of the plant, which began operation a year ago, was $6 million.

Parke, Davis is planning to build a $10-million medical research center, to be completed in about three years.

•

President Eisenhower's budget is committed to prosperity. That's the important point for business to remember, rather than the balanced budgets for this year and next. Barring a big turndown, corporate and excise taxes will stay where they are—at least for the next 12 months, as federal spending starts edging up. The taxes generated by prosperity have outrisen the spending. But don't expect an economic turndown to bring a cut in government expenditures—they'll keep on jogging upward.

Big government is here to stay—and it's getting bigger. That's evident, both from the over-all figures, and from these items of chemical importance:

	Fiscal '55	Fiscal '56 Planned	Fiscal '57 Asked
	(in millions of dollars)		
Commerce Dept.			
Bureau of Standards	$7.2	$8.3	$12.0
Patent Office	11.2	10.6	12.1
Business & Defense Services Adm.	5.2	6.7	7.4
Health-Education-Welfare Dept.			
Food & Drug Administration	6.1	7.0	7.9
Public Health—pollution work	3.3	4.7	5.9
Interior Dept.			
Bureau of Mines—resources work	13.8	13.9	16.9
Saline water research	0.4	0.5	0.5
Justice Dept.—antitrust	3.0	3.4	4.2
Federal Trade Commission	4.0	4.6	5.3
National Science Foundation	10.2	14.4	30.0
Atomic Energy Commission	1038.7	1365.0	1632.0
Research and development	289.8	395.5	530.8
Defense Dept.—research and development	1507.4	1495.0	1580.0

•

Will Koppers complete its integration from coal to organic pigments? That's the speculation in dye and pigment circles following Koppers' takeover of Pittsburgh Coke & Chemical's Fine Chemicals Division sales force. The crackerjack technical staff that has been working on phthalocyanine manufacture for Pittsburgh for the past two years was acquired by the American Aniline Section of the company's chemical division. The division is basic in intermediates used in organic pigment manufacture.

American Aniline has long been worried about the effect that textile printing (with pigments) would have on vat dyestuffs sales. It once had a finger in the pigment market via Ansbacher-Siegle Corp., when both were Bernard Armour holdings.

Koppers, itself, reports that it has no plans to shop for a pigments plant, though certainly there would be no reluctance to discuss such an acquisition "if a good one were tossed at us."

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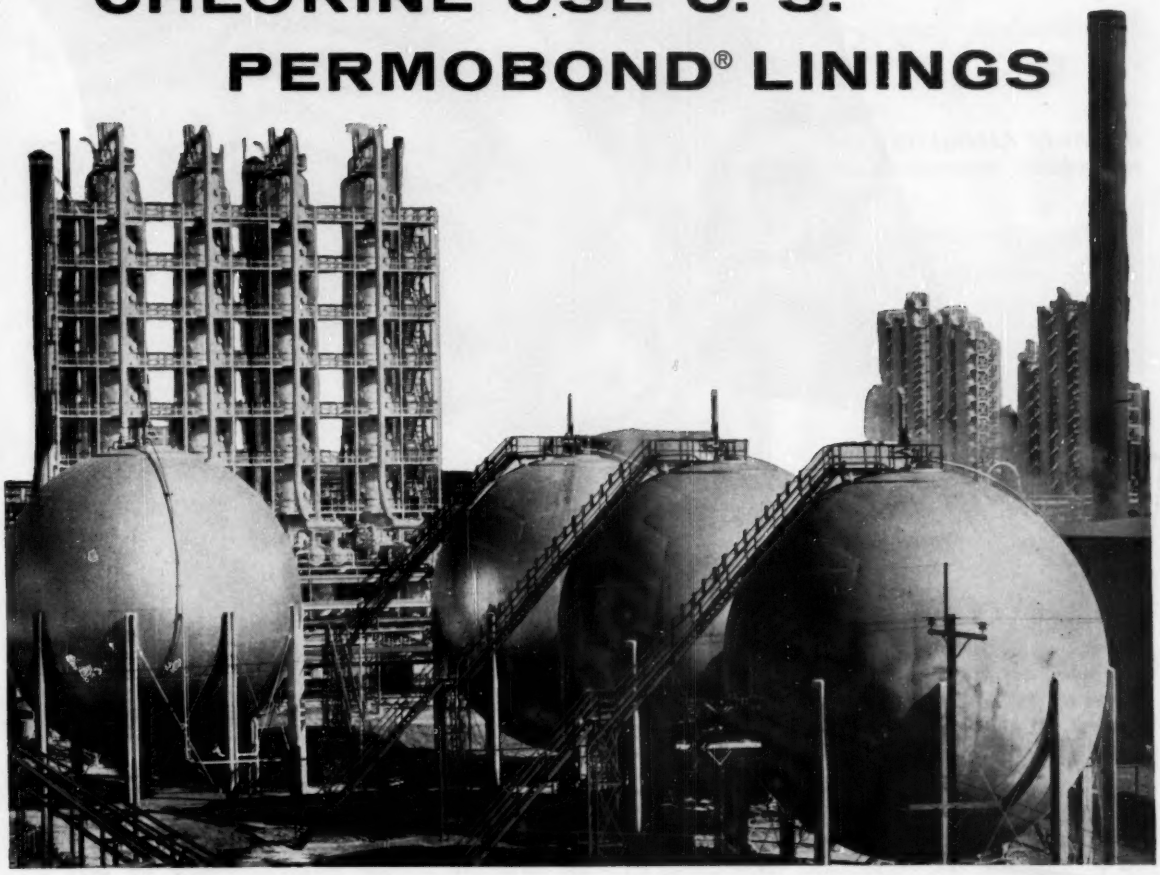

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"U. S." has a field force of special sales engineers to solve your corrosion problems. Get in touch with us at Rockefeller Center, New York 20, New York.

FROM EVERY STANDPOINT, PERMOBOND #5471 IS THE SUPERIOR LINING.

US RUBBER

Mechanical Goods Division

United States Rubber

UNION CARBIDE has long been closely identified with silicones through the work of its Division, Linde Air Products Company. To an important degree, industry has come to "Look to LINDE for Silicones."

Silicones are incredibly versatile man-made chemicals offering startling advantages in more and more products and processes. You may find that their stability under wide temperature change is the quality that interests you. Or it may be their water repellency, their high electrical resistance, or some other special property.

Interesting new developments, as well as the many proven needs, have now led to the formation by Union Carbide of a Silicones Division. With the world's most modern silicones plant almost ready to go on stream at Long Reach, W. Va., this new Division will be responsible for Union Carbide's program for the development, manufacture, and sale of silicone products.

This is more than just a change of name. While addresses and telephone numbers will remain the same, customers will be served by still further expanded sales and technical staffs.

But of prime importance, it means that through the expanded organization and vastly increased output, Union Carbide will provide more silicone products, in a greater variety, to match the needs of the fast-growing number of its silicone users. If you haven't already checked on the potentialities of silicones in your business, you should. Now, more than ever, it will pay you to . . .

UNION CARBIDE Trade-Mark SILICONES

Look to UNION CARBIDE *for silicones*

Principal Divisions and Subsidiaries include

Silicones Division • Pyrofax Gas Corporation • Carbide and Carbon Chemicals Company • Bakelite Company • Haynes Stellite Company National Carbon Company • Linde Air Products Company • Union Carbide Nuclear Company • Electro Metallurgical Company

BUSINESS & INDUSTRY . . .

←BOARD CHAIRMAN EVANS: He sanctions autonomous divisions for Diamond.

PRESIDENT SARGENT: He's shooting for record sales in the future.

Into the $100-Million Class

Even for a record-breaking year like 1955, a 53% increase in net profits (equivalent to $3.38/share) is a noteworthy hike for a chemical company. And that's the increase set by Diamond Alkali, first of the majors in the industry to report its calendar year earnings.

Whats more, these figures are all the more impressive, considering they're based on an 18% increase in sales to $110 million. That puts Diamond in the $100-million-and-above ranks for the first time in its corporate history.

How is Diamond able to post such a record? And what is its planning for 1956 (even in the face of talk about slight business slide-offs later this year)?

Autonomous Divisions: Board Chairman Raymond Evans, and Diamond President John Sargent attribute much of last year's gains to the company's two-year-old "autonomous division" setup.

In fact, they put so much faith in it, they've decided to set up two more such self-managing divisions as of Feb. 1. Frank Chrencik (former works manager of the Deer Park plant in Houston) will pilot the new Electrochemicals Division; Henry Clark (manager of Diamond's New York-New England branch sales office) will head the Soda Products Division.

Plants in Chrencik's realm will include: Edgewood, Md., and Painesville, O.; Muscle Shoals, Ala.; Pine Bluff, Ark.; and the Deer Park plant at Houston, Tex.

Clark's Soda Products Division (to be quartered in Diamond's highly integrated Painesville alkali manufacturing plant) will handle "basic alkali chemicals" (soda ash and bicarbonate of soda) and their upgraded derivatives.

Expansion Plans: What about Diamond's near-future expansion plans? "In the next five years," Sargent claims, "some $12-16 million/year in capital expenditures will go for expansion of existing plant facilities."

The Painesville operation is scheduled to get the bulk of this outlay, even despite the fact that it now accounts for less than 50% of Diamond's sales volume.

In addition, expansion capital will definitely be set aside to enlarge perchlorethylene operations at Houston. Reason: in 1955 the unit turned the profit corner and production soared well above the plant's rated capacity.

And from the looks of things now, financing for future expansions will come from retained earnings—not from new public stock issues. In fact, at the close of '55, Evans says, the company was in a strong financial position, with $14.3 million on hand in cash (compared with only $7.0 million in '54).

What About Muscle Shoals? According to Evans, Diamond's experience at its Muscle Shoals chlorine plant (acquired from the government in '54) was "rewarding in many ways but not especially profitable in '55." That plant is now operating at 80% of its rated capacity and sales are expected to hit some $9-10 million when

full capacity is attained. But, says Diamond management, the plant location is in a growing market for chlorine and caustic. "And that makes its acquisition look good," Evans adds.

Pine Bluff Outlook: What about the outlook for Diamond's leased (but still government-owned) chlorine unit at Pine Bluff, Ark.?

Apparently, the company has about-faced on that issue. Last summer, Diamond's management notified the government of intentions to drop its lease by the end of '55. Reason: company management assumed that its newly acquired facility at Muscle Shoals would provide amply for its needs in the Southern market.

"But now," President Sargent claims, "a sufficiently wide market has been developed for chlorine in the South Central and Eastern areas, and we've decided to hang on to the Pine Bluff facility."

Sargent's forecast for Diamond: $150 million total sales volume by 1960.

Manpower Catalyst

Top-flight chemical executives—as well as novice technical manpower—are hard to come by these days. So companies are more and more trying to make sure that both present and potential employees are fitted into the right jobs.

The problem, serious for all companies, is especially pressing for growth firms with widely separated plants, and a diversity of products.

Latest convert to such thinking is Food Machinery and Chemical Corp. (New York), which has just created a new company post — management recruitment and placement coordinator—and has named Robert McEwen to the job.

He'll act as "catalyst," working with FMC management of six operating chemical divisions, and with central research organization and staff department heads.

Organizationally, McEwen will report to the chemical divisions' industrial relations director, Samuel Pond. But the brunt of "coordinating the company's manpower needs with its manpower assets" will fall on McEwen.

The move is FMC's first attempt to coordinate under one roof all personnel recruitment functions.

PHOTOS—KWING GALLOWAY

GOING HOME EARLY: With 'reporting pay' clause, they still get wages.

PAID FOR NOT WORKING: For chemical workers, more agreements on . . .

Off-Duty Pay: Trend Is Up

Long gone are the days when a paymaster could figure up his payroll from two simple factors on time-cards: hours worked multiplied by hourly rate.

More and more, chemical companies are adopting policies calling for payments for time not worked. Where a number of such off-duty pay clauses are in effect at a single plant, it's possible for a given employee—lucky or unlucky, depending on circumstances—to draw full pay for a period of days, weeks, or even several months without doing a lick of work for the company.

As of this week, local labor unions are hammering hardest at getting pay provisions for work-days lost on account of jury service or because of death in the family. They've already got nearly complete coverage on reporting pay; and up to now the unions haven't become very much excited about separation payments for employees going into military service.

Nearly 100%: A recent survey of labor contracts at 70 plants turning out chemicals and allied products shows that 96.5% of the 97,800 employees are covered by provisions for reporting pay.

More than two-thirds of those contracts call for payment of four hours' regular earnings to an employee who reports on schedule and is then sent home for lack of work to be done. A graduated scale of payments was provided in 11.5% of these agreements, and other contracts called for payments ranging from two to eight hours' pay.

In virtually every respect, these chemical contracts turned out to be more liberal on reporting pay provisions than agreements in other industries. Only 90.4% of the contracts at 1,267 manufacturing plants of all kinds had reporting pay clauses; and for 1,737 establishments in all kinds

of industries, the corresponding figure was just 80.5%.

Three Days' Death Leave: Of the 70 chemical contracts, 26 called for the company to grant "up to three days" of paid leave in case of death in a worker's family. Eight pacts specified three days' leave with full pay, and two called for one or more days.

At one of the surveyed chemical plants, employees draw full pay while serving on a jury panel; but the prevailing practice—stipulated in 25 contracts—is for the company to make up the difference between what an employee receives in jury fees and what his regular earnings would be for the time lost from work. Two other contracts have jury pay provisions but the amounts are not defined.

In all, 40% of the chemical contracts provide for jury-duty pay.

'Lightning' Hazard: Much less common are provisions for extra pay for employees going into military service. Twenty-three percent of the chemical contracts and 10% of all manufacturing contracts have clauses of this kind.

These off-duty pay clauses represent another field in which industry is asked to deal out personal benefits that are deemed—by labor unions and other groups—socially desirable. Employers can only hope that yearly outlays on these nonwork pay provisions will be relatively even, and that not too much lightning—in the form of selective service inductions and jury calls—will strike in any one year.

G.I.'S BONUS: To ex-chemical worker, civilian pay on military post.

RENI PHOTO

RUBBER DISPOSAL: Plant sellers Pettibone and Holland, still under fire.

Loaded Question and Reply

The Administration's strategy in the upcoming battle to win Congressional approval for sale of the giant Institute, W. Va., synthetic rubber plant is now out in the open. It's that well-tested stratagem that the best defense is a strong offense.

This was made clear in last week's report on the $11 million deal sent to Congress by the Rubber Producing Facilities Disposal Commission and Attorney General Brownell. They hope to head off a Democratic veto by trumping the opposition's strongest suit: letting the sale stand or fall on how the deal stacks up for small business rubber users.

The commission apparently has already spiked any arguments that the sale to Goodrich-Gulf Chemicals, Inc., is a GOP giveaway to big business. The second-best offer, its report revealed, was $5.8 million by independent oilman Edwin W. Pauley. This was "not full fair value for this plant," the commission said. Other final bids ranged from $750,000 by the Dutch-owned Imperial Commodities Corp. to $4 million by United Rubber & Chemical Co. They and Goodyear Synthetic Rubber Co. ($2 million bid) withdrew when the commission set a $9.5 million minimum price tag on the plant a week before negotiations closed. A sixth bidder, Union Carbide and Carbon, stuck it out with a $2.7 million offer.

Commission chief Holman Pettibone and head negotiator Eugene Holland (*see cut*), with an assist from Brownell, meet the Democrats' expected main line of attack—monopoly and small business issue—by making these points:

- Sale of Institute, regardless of the buyer, will add to the supply pool of rubber drawn on by large and small consumers. Goodrich-Gulf is committed to put on the market at "fair prices" to small users a hefty share of Institute's output—21,000 tons (50%), when the plant operates at one-third capacity, to 81,000 tons (73%).
- All present GR-S synthetic rubber producers are expanding, except Goodrich-Gulf. Potential U.S. output will be stepped up from a current 733,000 tons yearly (less Institute) to nearly 1.1 million by late 1957. While Goodrich-Gulf's share will jump from a third-largest 12.3% to industry leadership at 25.2% with Institute, it will diminish steadily as others expand and new plants are built.

Had the deal been a conventional merger by private parties, Brownell said, he would have struck it down. But, an "objective evaluation of this proposal (Goodrich-Gulf's purchase) must take into account the fact that it cannot lessen competition on the production level, because it creates additional competition and eliminates no competitor. Perhaps of more importance," the Attorney General emphasized, "It can and should increase competition on the fabricating level."

Washington Angles »»

»» **Newest plans on overhauling patent laws** will be detailed by a Congressional group early next month, following up its report made last week to the full Senate Judiciary Committee.

This report briefly hits at the conflict between Patent Office and the federal courts on what is patentable, suggests the need for new legislation. Importantly, it backs higher salaries and a bigger staff for the Patent Office.

»» **No new "fair-trade" legislation this session.** That's the prediction of Sen. Hubert Humphrey (D., Minn.), one of the strongest "fair-trade" proponents in Congress. Humphrey's Small Business subcommittee plans hearings once it gets back answers to questionnaires it sent manufacturers and retailers to find out how "fair-trade" is holding up in the marketplace.

»» **Tax write-offs for defense-needed plants** will be granted on the basis of new industrial dispersion rules. Office of Defense Mobilization last week conceded that the old guides are not valid in the era of fission-fusion-fission nuclear weapons. Commerce Dept.'s Area Development Division will screen future applications for such process industry expansions as those for glycerine, alkylation and petroleum refining facilities.

»» **Shipping radioisotopes overseas** will be easier under new Atomic Energy Commission regulations. Effective Feb. 10, isotopes of 81 elements may be sent abroad without requirement that a purchaser report on usage, or have a representative in this country.

COMPANIES . . . .

Atlas Powder Co. directors have approved acquisition of Aquaness Corp. (Houston), producer of petroleum dehydrating compounds, corrosion inhibitors, bactericides and other oil industry chemicals.

The move will put Atlas closer to consumer markets.

•

American Machine & Foundry Co. has established a commercial development division at Springdale, Conn., mainly to handle new chemical processes.

•

Harshaw Chemical Co. stockholders authorized a 2-for-1 stock split effective immediately. There are 959,248 shares outstanding.

EXPANSION . . . .

Industrial Gases: Air Reduction Sales Co. will expand oxygen, nitrogen, and rare gas producing capacity at a cost of $16 million. A 75-tons/day oxygen unit will go up in Chicago. Other new units are slated for Alton, Ill., and Calvert City, Ky., and gas output will be doubled at Butler, Pa., increased 25% at Riverton, N.J., sites.

•

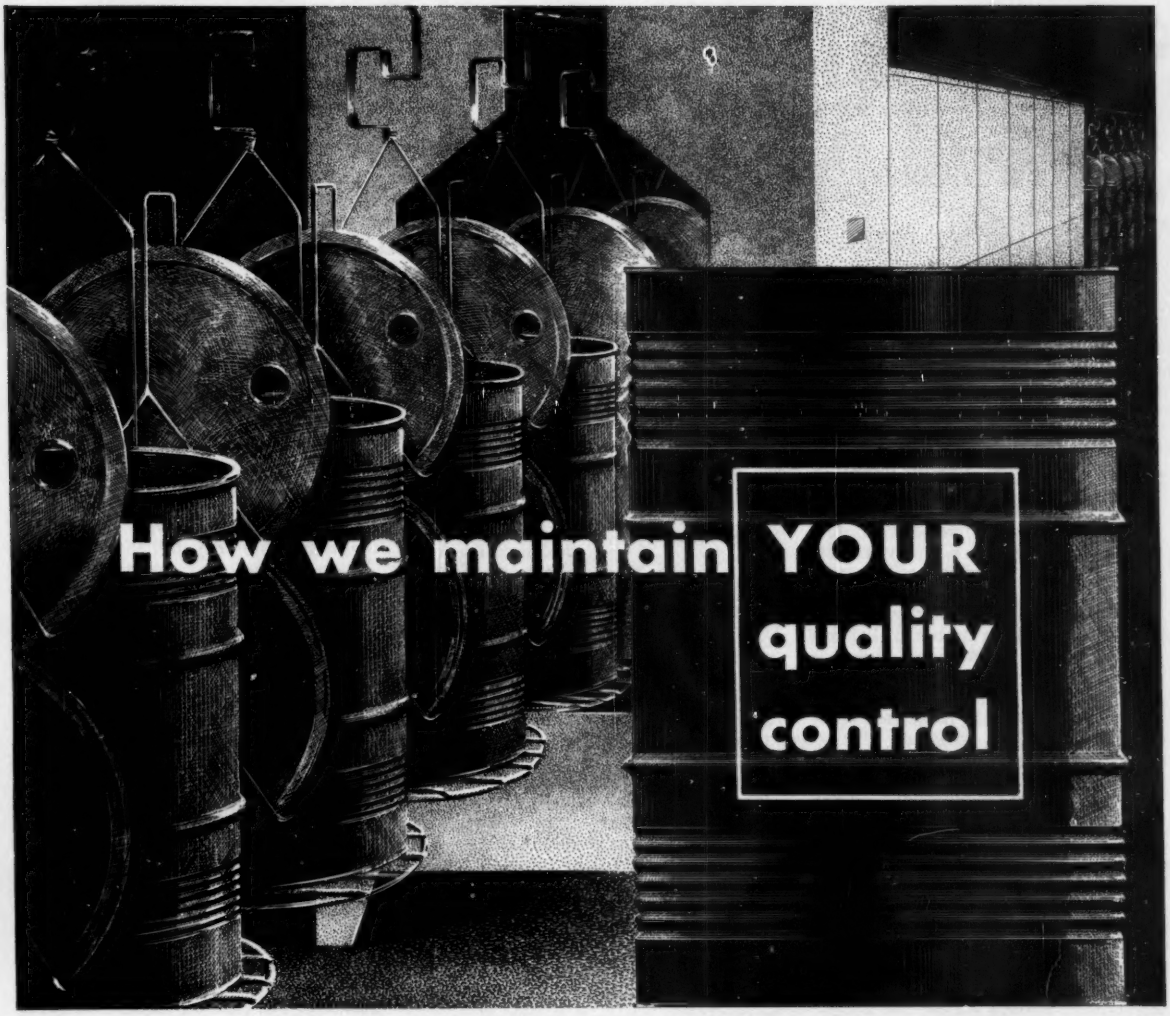
Future Expansion: Procter & Gamble Co. will more than double the present size of manufacturing administration and research headquarters in Cincinnati at a cost exceeding $1.75 million.

Light Hydrocarbons: Kentucky Hydrocarbon Co. will construct an extraction plant for ethane, propane and butane at Maytown, Ky. The company will also build a 100-mile pipeline linking Carbide and Carbon's Institute, W. Va., plant with Kentucky liquid-gas sources.

WEBER

Posting Price for Stock Trade

OPPOSITE the symbol MCH on American Stock Exchange quotation board, Ted Marvin, president of Michigan Chemical, jots down the "10" that opened trading of his firm's stock Jan. 10. Supervising are Robert J. Smith, center, and Gerald A. Sexton, who will specialize in trading the issue. In the first four days of trading, some 2,100 shares were reported to have changed hands.



Every USS Steel Drum goes through three careful steps to make certain your product arrives at your customer's door as pure as it left your plant.

All surfaces of the drum body, head, and bottom are completely descaled, then purged with a strong alkali solution, removing all traces of dirt and grease. With the interior and exterior now immaculately clean, the drum is ready for a thorough coating with a special phosphate formula that means long-term freedom from rust. Each of these steps is vitally important to quality-controlled shipping. They mean that nothing will happen to your product during shipment or storage that could nullify the results of your own rigid quality control measures during manufacture.

USS Steel Drums are available in sizes from 2½ to 110 gallons, either plain or decorated. If yours is a special case . . . we have a wide variety of fittings and openings that are sure to meet your individual requirements.

"It's Better to Ship in Steel"

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DIVISION
UNITED STATES STEEL CORPORATION
DEPT. 316, 30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

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SEE The United States Steel Hour. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

USS STEEL DRUMS

USS

UNITED STATES STEEL

Corrosioneering News

Quick facts about the services and equipment Pfaudler offers to help you reduce corrosion and processing cost.

Published by The Pfaudler Co., Rochester, N.Y.

New trailer-tank saves time and money with liquid transfer

Liquid shipment eliminates drying and packaging, saves the cost and trouble of returning your product to a liquid state upon arrival.

You can now ship, in liquid form, solutions of all acids except hydrofluoric, and all alkalies up to pH 12, to 212° F.

The new Pfaudler glassed steel trailer-tank is delivered complete with signals, reflectors, and hydraulically operated stand wheels to support it independently.

The tank itself is tough Pfaudler glassed steel. This material, besides being especially economical and corrosion resistant, proves ideal for a mobile tank of this type because of its physical strength. In actual demonstrations, a 36″ strip of glassed steel can be flexed 6″ in either direction without damaging the glass. This is plenty of "give" to absorb the bumps of the road.

The Pfaudler trailer-tank is equipped with sliding hood to protect the vent, manhole and dip pipe at the top. Dip pipe for filling or emptying, glassed both sides and tantalum tipped, reaches down into sump at bottom of tank to assure complete emptying. Tank also has convenient bottom outlet for washout.

For additional details, call your Pfaudler representative or send for Data Sheet 29.

"Performance" takes driver's seat as basis for selecting equipment

Why Pfaudler created new engineering group

John W. Cosier

To *simplify* selection of equipment that will *perform* as required to obtain desired yields, Pfaudler has established an Applications Engineering Group.

This section, working with design, development, research and production groups, studies each customer's exact production needs, and selects or designs the proper equipment to match these requirements.

Thus, you have even greater freedom from mechanical restrictions than ever before, since each unit of equipment is carefully chosen to provide the yield you want.

This new group of selected engineers—with extensive backgrounds in chemical production problems—is headed by John W. Cosier.

Pfaudler's Applications Engineering Group has four fields of information at its fingertips:

1. Specialized knowledge of all types of glassed steel, stainless and alloy vessels.

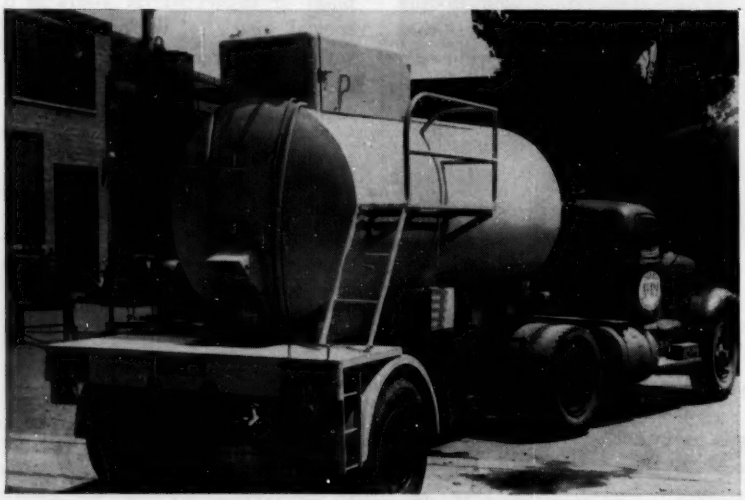
2. Pfaudler's 72 years of experience in corrosion-resistant equipment.

3. Experimental, test and user data, compiled in Pfaudler's corrosioneering library.

4. Personal experience of each member of the group.

Pfaudler has already had much experience supplying equipment on a performance basis for: absorption, centrifugation, crystallization, distillation, drying, evaporation, liquid extraction, filtration, flow of fluids, leaching, materials handling and mixing. May we help you?

Example of a Pfaudler application and project engineering: The 25 glassed reactors in this large PVC plant are specially equipped for high internal pressures.



Glassed steel trailer-tank is corrosion resistant, permits low-cost shipment of materials in liquid state.

New reactor manhole is bigger, handier

Reaction kettles by Pfaudler in larger sizes are now equipped with an 18″ diameter round manhole, compared to the old elliptical 12″ x 16″ opening.

Also, the manhole has been moved nearer the side of the reactor.

This new manhole not only offers a portly portal for hefty chemical workers (up to size 56!) but also provides easier visual inspection and cleaning, and a safer angle for positioning ladders.

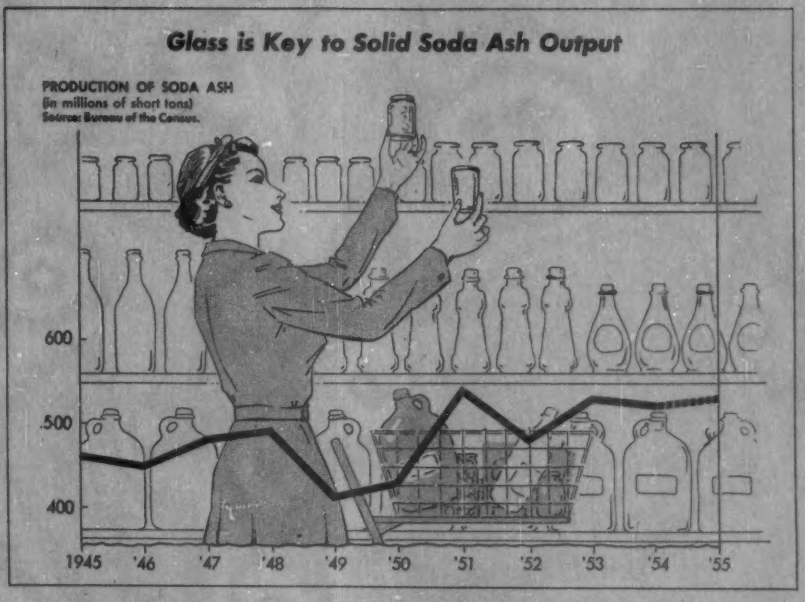
For details of this and other design improvements in the new Pfaudler reactors, call your Pfaudler representative or write for Bulletin 926.

PLASTICS: Corrosion resistance and non-adherence of Pfaudler glassed steel reactors are ideal for polymerization. If your product is sticky, corrosive or sensitive to contamination write or wire us for further details on Pfaudler equipment.

Charting Business

CHEMICAL WEEK
January 21, 1956

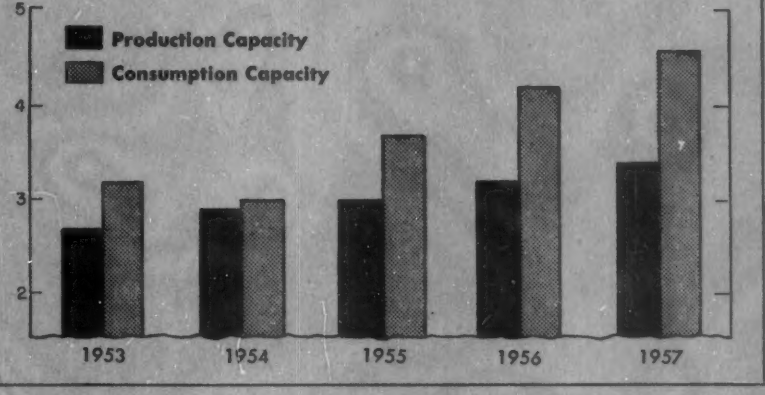
Glass is Key to Solid Soda Ash Output



SUPERMARKET sales constitute a veritable State of the Union message for soda ash makers because of the fast increase in glass-bottled products appearing on grocers' shelves. A recent survey shows that production of glass products rose about 30% over the period 1947-55, with bottles, auto glass and construction glass the biggest gainers. To meet this increasing demand, plus the demands of the chemical and pulp and paper industries, soda ash producers upped output about 10% in the same period, should hit 6 million tons in '56.

Free World Production and Consumption Capacity in Chemical Cellulose

(in millions of tons)



UNLIMITED horizons are envisioned by free-world cellulose makers. Reason: diversification of chemical cellulose end-uses—concomitantly increasing world trade.

Right now, one leading U.S. producer, accounting for about 50% of domestic and 20% of world production, exports about 40% of its output.

Widening uses of this product in synthetic textiles, tire cord, cellophane and particularly fine paper manufacture are safe guarantees on which the industry bases its present confidence in the future.

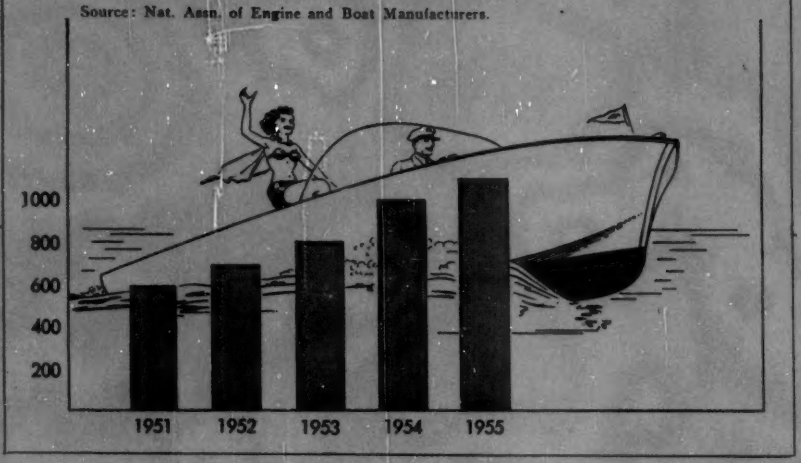
Charting Business

(Continued)

Chemicals Win as Dollars Spent for Recreational Boating Mount

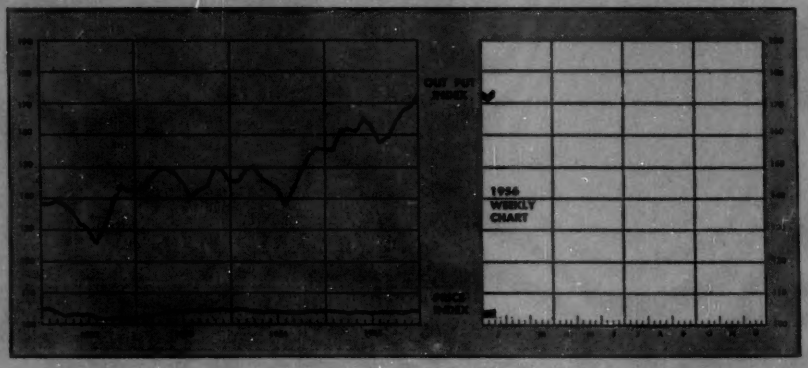
(in millions of Dollars)

Source: Nat. Assn. of Engine and Boat Manufacturers.



PROFITS on some chemicals will be logged in at a record level this year in the wake of the launching of 6 million recreational craft. Reason: the yachting fleet is one of the fastest-growing markets for a host of chemicals. In 1955, pleasure boats used some 5.6 million gal. of special paints and varnishes, 160,000 lbs. of nylon lines, 460,000 gal. of liquid detergents. Too, the growing use of plastic hulls holds a promise for increasing sales of polyester resins and glass-fiber support materials. However, plastic hulls need no repainting.

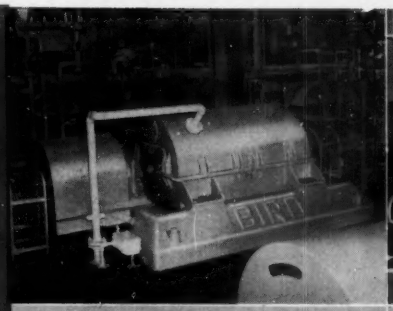
BUSINESS INDICATORS



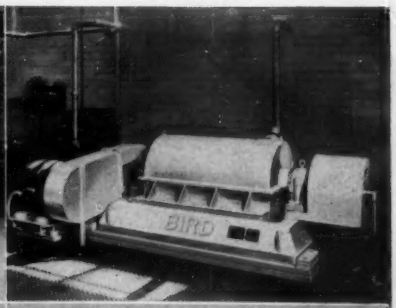
WEEKLY	Latest Week	Preceding Week	Year Ago
Chemical Week Output Index (1947-49=100)	173.5	173.5	154.8
Chemical Week Wholesale Price Index (1947=100)	105.2	104.9	104.5
Stock Price Index of 11 Chemical Companies (Standard & Poor's Corp.)	470.6	480.7	364.8

MONTHLY—Wholesale Prices (Index 1947-1949=100)	Latest Month	Preceding Month	Year Ago
All Commodities (other than Farm and Foods)	119.7	119.4	114.9
Chemicals and Allied Products	106.7	106.6	107.0
Industrial Chemicals	119.4	119.3	117.4

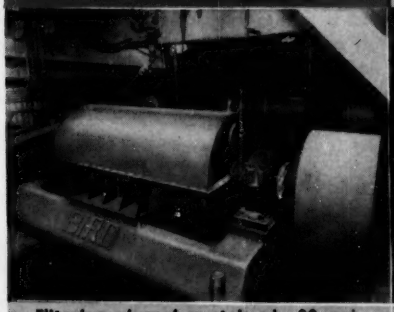
SIX INTERESTING FILTERING PROBLEMS



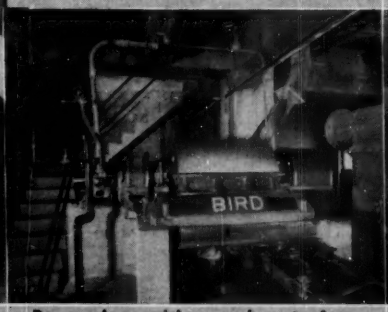
Filtering fine salt crystals from 80% glycerine solution at a temperature of 300°F. High temperature offers no problem to the successful use of the Bird Filter.



Filtering a food product. The Bird is the ideal filter — completely enclosed, involves no delay in process, easily sterilized.

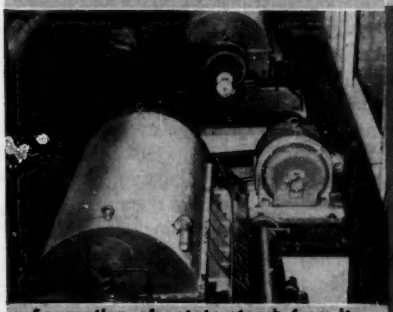


Filtering mineral crystals, plus 28 mesh, plus 4 abrasive hardness. The mother liquor is a hot saturated solution. A tough problem for most filters but "duck soup" for the Bird Filter.



Recovering calcium carbonate from water softening sludge. The feed contains valuable calcium carbonate but undesirable magnesium and iron compounds. The Bird is operated to recover the values but discard the rejects with the filtrate.

Separation of vegetable meal from a solvent-oil miscella. Solvent recovery is obviously important. The filter must be vapor-tight to allow recovery and provide safety. Birds are 100% tight when specified.



Separation of potato starch from its protein water. This job must be done quickly otherwise the starch will discolor. Material is retained in the Bird only a few seconds, no time for oxidation. High quality starch is the result.

ONE BIRD SOLVES THEM ALL

WITH AN ASSIST FROM

THE BIRD RESEARCH AND DEVELOPMENT CENTER

These are just a few of the hundreds of different jobs being handled efficiently and economically by Bird Continuous Centrifugal Filters. On some, solids are a fraction of a micron in size; on others they are ½" or more. Feed slurries range from 3% solids or less to thickener underflows. Cost of operation and maintenance generally totals a few cents or less per ton.

Why not find out if the Bird Continuous Centrifugal Filter is the answer to *your* filtering problem? You'll get the *right* answer *quickly*, based on accurate pilot-scale test data prepared by the Bird Research and Development Center.

BIRD MACHINE COMPANY
South Walpole · Massachusetts

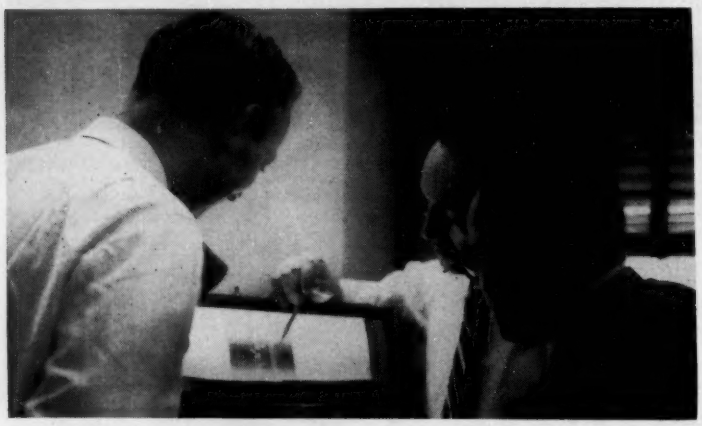
REGIONAL OFFICES: EVANSTON, ILLINOIS • PORTLAND, OREGON

BIRD CONTINUOUS CENTRIFUGAL FILTER

— a part of the *most complete* line of equipment for separating solids from liquids.

'Longer Hairs' Bring Blessings and Problems

AUTOMATION: Expert Yachter (standing) outshines 'boss' Skelly (right).



CORROSION 'BRAIN-TRUST': Probers Zeis, Hoyt and Sorell.

PEISER, KAO: They feel most at home with digital data.

MURPHY, WEIL: They think in terms of future boiler code revisions.

As chemical technology gets more complicated, management finds it's getting harder to know which new process is the best one on which to bet millions of dollars of company funds.

And so, more and more, management is hiring "longer-haired" experts with no thought of giving them specific responsibility for routine company problems. Instead, working teams of such men get assignments defined in broad terms, and hope they can break through the limiting framework of knowledge of those with specific day-to-day responsibilities.

The team concept of "ivory tower" research, of course, is not unique. The pooling of knowledge of a melange of theorists—mathematicians, instrumentation and control experts, physical chemists, geophysicists and other such specialists—has led to many important technological break-throughs. Hence its attraction—both to large chemical firms like Dow or Du Pont, and to such development and engineering concerns as Atlantic Research, Foster-Wheeler, M. W. Kellogg or Lummus.

What kind of management situations can chemical companies expect to encounter when they revamp their organization charts to include ever-increasing numbers of such expert teams?

Healthy Taste: One firm—M. W. Kellogg Co.—is getting an after-

See what a difference ALCOA Alumina makes

ALCOA Alumina increases stability and high-temperature resistance of refractories. This is clearly shown in the specimens illustrated above which were tested in the hot zone of a rotary cement kiln. The 70% alumina block, containing only *natural* aluminas found in bauxite and clays, lost 2½"-3" of its original 6" thickness. But, the brick (Taycor) fortified with 88-90% ALCOA Alumina showed maximum loss of 1½". Both bricks were in service equal time. You can see what a *big* difference ALCOA Alumina makes.

Picture and data courtesy The Chas. Taylor Sons Co., a subsidiary of National Lead Company, Cincinnati, Ohio.

Whatever your operating temperatures, you'll have less costly downtime as a result of too-frequent refractory replacement, when you use refractories made with ALCOA Alumina. They give you these money-saving qualities.

- Strength and stability under load at high temperatures.
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ALCOA does not make refractories. You can buy brick and other shapes, containing various percentages of ALCOA Alumina to meet your requirements, from leading manufacturers like The Chas. Taylor Sons Co. We'll gladly refer you to reliable suppliers. Write to ALUMINUM COMPANY OF AMERICA, CHEMICALS DIVISION, 707-A Alcoa Building, Pittsburgh 19, Pennsylvania.

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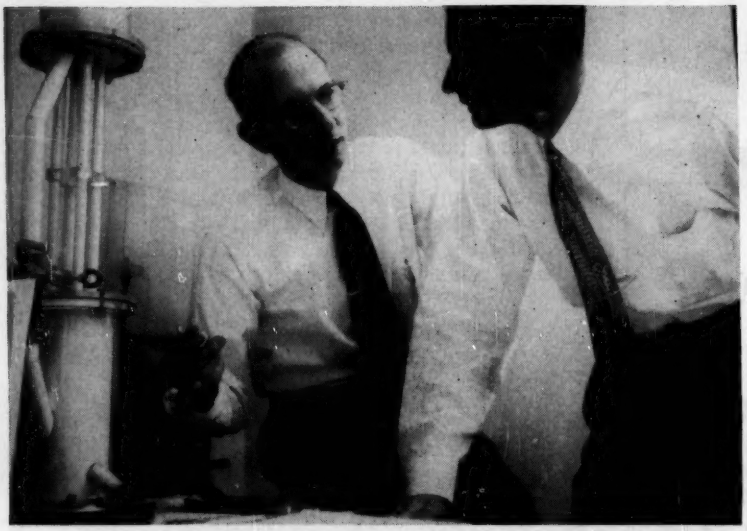


CATALYST TEAM: Models Zenz and Smith tackle inscrutables.

dinner sample of both the drawbacks and the benefits that can be expected in assimilating such experts.

Its group of 21 specialists admittedly can create more than a goodly share of unusual management headaches, if for no other cause than personal, technical and specialty background differences.

Where five men have Ph.D. degrees, three have no degree at all. The age range is from a high of 53 to a low of 22. Three-fifths are American-born; others hail from Austria, Estonia, Poland, Hungary, Pakistan and China.

Technical backgrounds are equally diverse, covering the widest range of skills and sciences. End result: the division can (and is) tackling such varied and abstruse technological problems as these:

- Complete automation of an ammonia plant. This project is perhaps one of the most comprehensive efforts of its kind in the industry.
- Adaptation of large digital computers to engineering design calculations.
- Use of gas turbines in chemical process plants.
- Analyses of chemical synthesis problems from thermodynamic and reaction kinetic viewpoints.

And Division Manager Joseph Skelly feels, in order to handle such problem spectrums, the widest-possible sampling of education, experience, age, national culture, and even patterns of thinking, is mandatory.

"But," he adds, "obviously the boss of such a brain-trust can't possibly hope to know as much as his worker-experts themselves. Yet, he's faced with managing them, motivating them, seeing they don't go too far out on a theoretical limb—from the company's viewpoint." At the same time, he's expected to stimulate them to independent thought and action.

New Frame: In short, it appears, for experts like these, chemical industry needs some new frame of management.

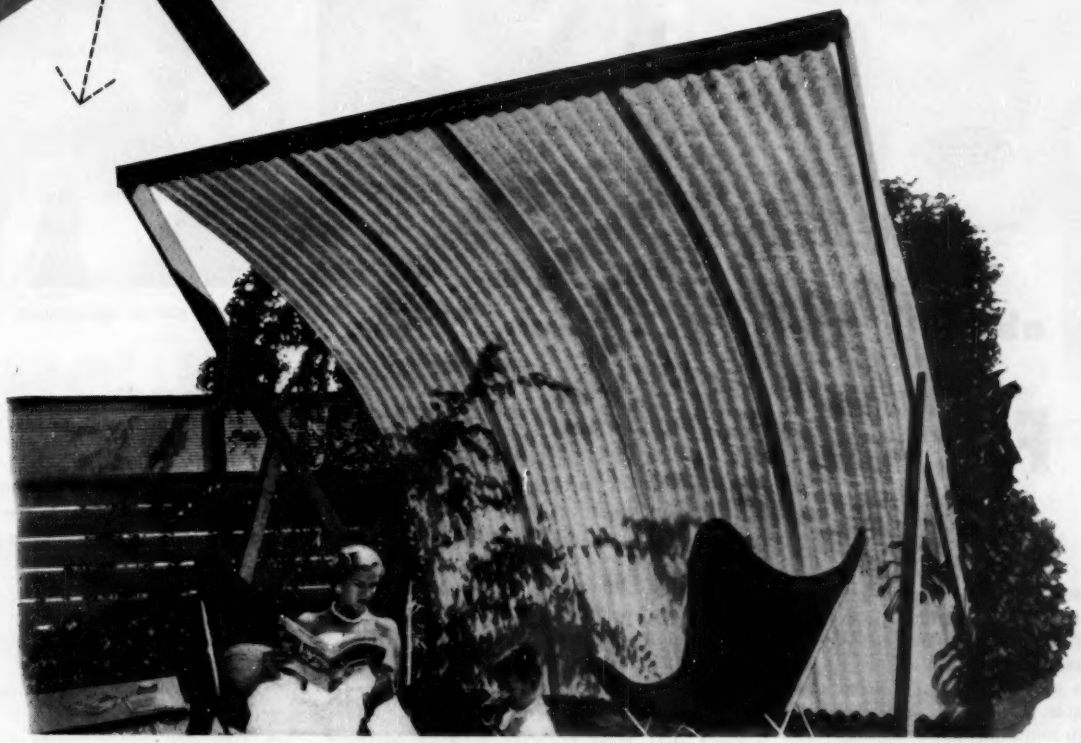
Right now, however, here's how Skelly is meeting some of his internal governing problems. He'll attempt to:

- Let each expert (or group leader) speak for himself at Kellogg, sign his own reports, present his own case at company meetings, even high-level ones.
- Circulate technical newsletters from his division throughout the firm. That's to foster closer communications between the "ivory tower" set and regular research and production departments.
- Encourage top management to evolve a new salary scale for his division. He's pressing for higher and higher salary rewards—even, he asserts, if they must exceed his own.
- Induce the "brain-trust" to participate in technical society functions, publish papers, articles.
- Develop managerial talents within the group itself by having men so inclined supervise small working teams, take management training courses. Those who feel the call of higher executive jobs are offered such opportunities in the company wherever possible.

Will such management ideas work, and will they be enough to cope with the problems of the longer-hairs? Skelly is the first to admit he doesn't know. But he's looking around, hoping to evolve fresh ideas on morale building, motivation and productivity.

NOON RITUAL: Grover, Sorell, Weil and Kulp team-play even at lunch.

NEW PRODUCT DIRECTIONS



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A small quantity of UV Absorber 9 incorporated in plastic covers for light fixtures will protect them from the detrimental effect of ultraviolet radiation. Perhaps there's an idea here for you—or it may point to others.

NEW PRODUCT DEVELOPMENT DEPARTMENT

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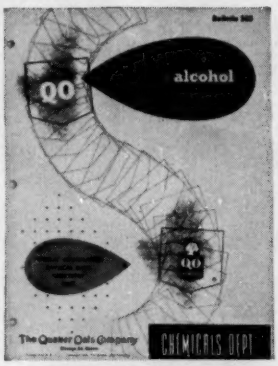

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WIDE WORLD PHOTOS

CONANT, VON BRENTANO: In latest of new patent agreements, a . . .

Promise of Protection

Calling for full protection of patent owners' property rights, the patent and technical information agreements being negotiated by the U.S. government with various other countries may bring about a new spirit of confidence on the part of U.S. industry in international patent dealings.

Latest of these agreements: the pact signed last week in Bonn, Germany, by U.S. Ambassador James Conant and West German Foreign Minister Heinrich von Brentano. This is of special interest to chemical concerns, in view of the importance of German chemical production.

Similar agreements have already been signed with all of the major industrial member countries of the North Atlantic Treaty Organization (NATO) except France; and negotiations are in progress for an agreement with that country and for one with Japan.

Governments Accountable: These patent pacts are designed to facilitate the exchange of technology—through license or other arrangements—that's important to mutual defense. The contracting governments recognize and agree to protect fully the private property rights to any information exchanged for mutual defense purposes.

The new agreement with Germany, for example, provides for setting up a joint technical property committee to mediate in patent and know-how disputes between Germans and Americans in the defense field and to assist in licensing negotiations if needed.

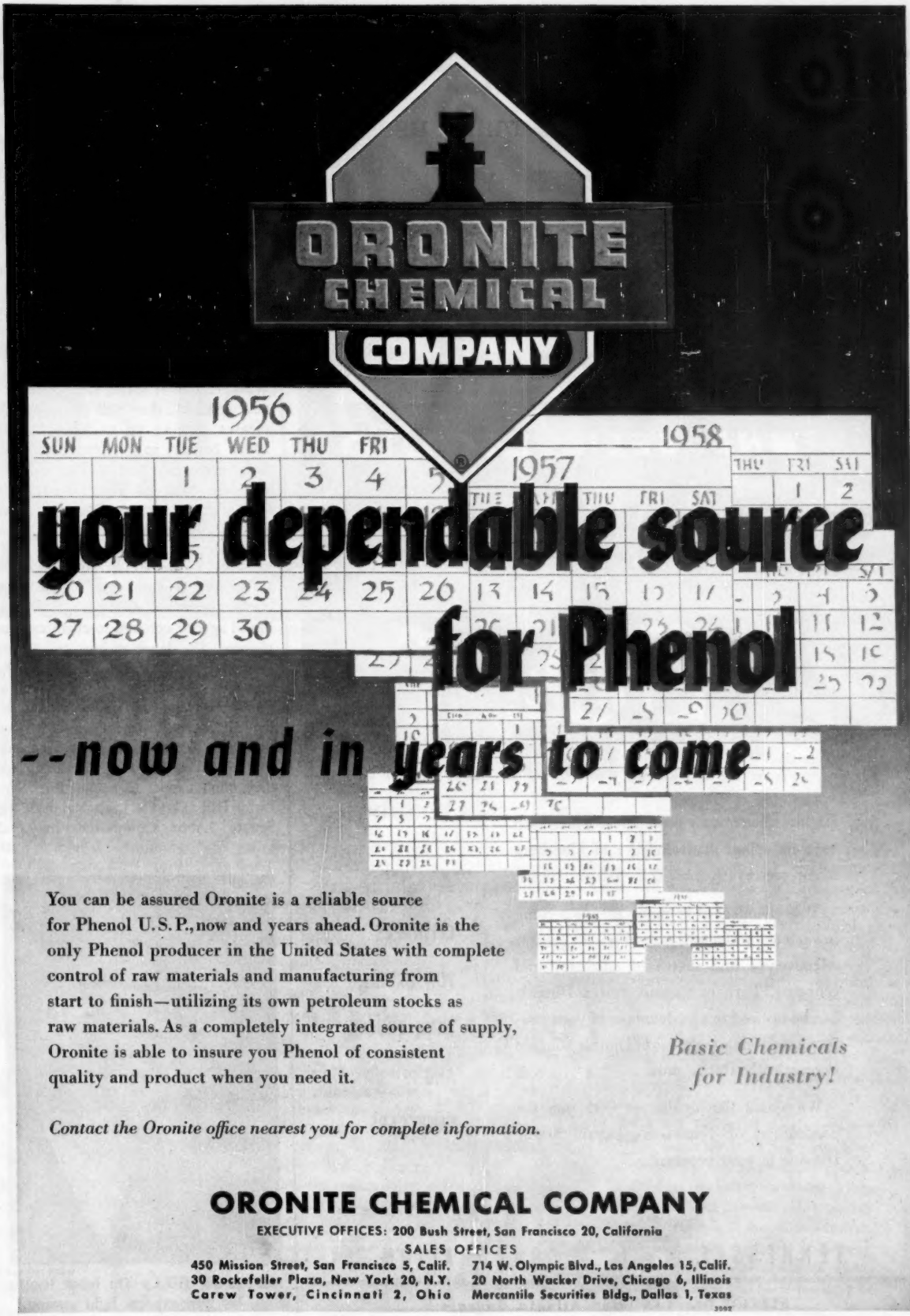
To encourage the exchange of defense patents and technical information, the agreement assures patent holders in both countries:

- That their governments will defend their property rights.
- That these rights are acknowledged by both governments.
- That the governments can be held accountable for any property right violations resulting from the mutual defense program.

Licensing Required: Specifically, the U.S. and German governments agree not to permit information gained under the defense program to be used for production unless a license is obtained from the owner of that information through normal commercial channels.

Patents and know-how owned by the governments themselves are excluded from these provisions, of course, as is all atomic know-how. The agreement is designed to supplement —not to replace—normal commercial licensing procedures.

The U.S.-German agreement stems directly from Germany's recent joining the NATO group and the launching of the West German defense effort. It's too early to predict to what extent it'll accelerate the exchange of chemical know-how; but it's bound to



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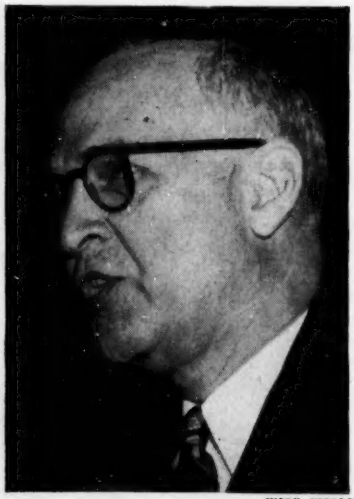
have some impact on account of the vital role of chemicals in defense production. U.S. officials are guessing that there'll be a considerable increase in licensing of U.S. chemical processes by German firms, and vice versa.

LABOR. . . . . .

Bargaining for Scientists: One of the rare instances in which a chemical company's scientific personnel are represented by a labor union is in Toronto, Ont., where laboratory employees of Lever Brothers Ltd. are members of the International Chemical Workers Union (AFL-CIO). In their new contract, they will get salary increases ranging up to $3/week and added benefits in overtime pay, vacation, seniority, and union security. Also, the company will now pay for a $7,000 group life insurance policy for each employee in the group.

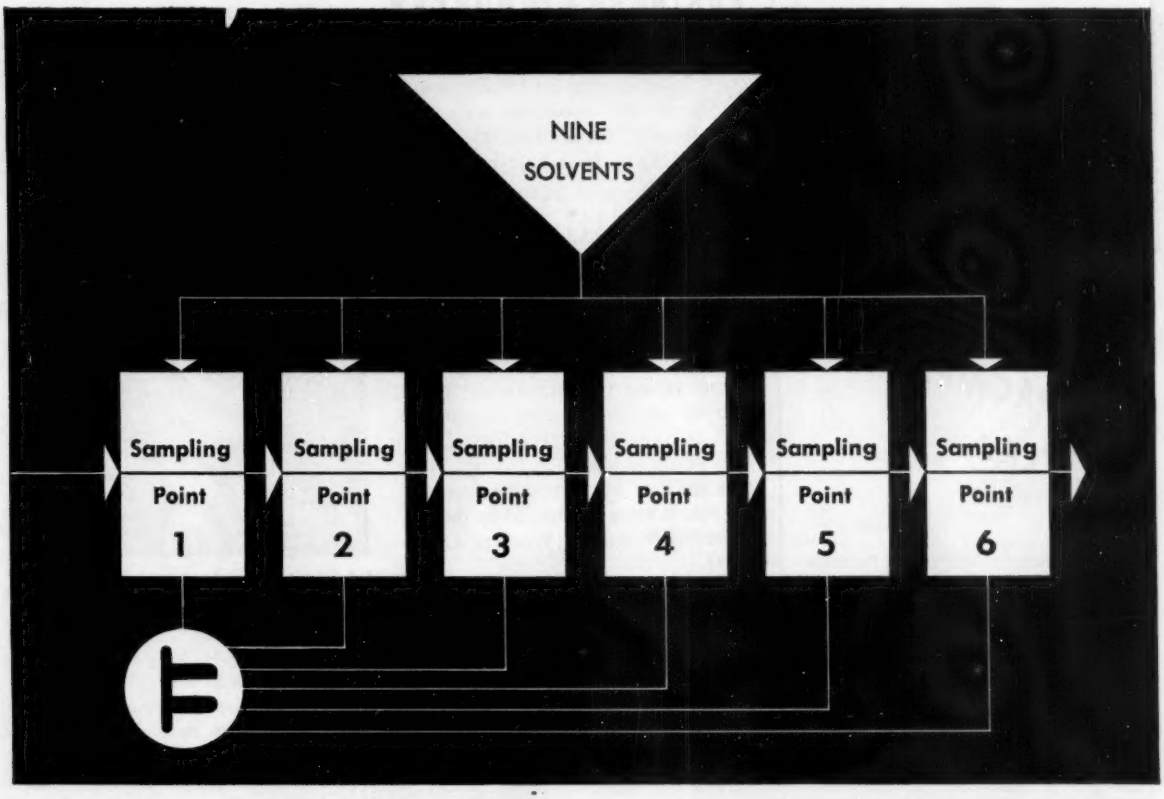
•

Labor Laws: Relatively little labor legislation is anticipated during the current session of Congress, and nothing of special concern to chemical employers. The labor unions are asking for sweeping revision of the Taft-Hartley law, increase in the federal minimum wage rate, and a law requiring all states to meet certain fixed standards on unemployment insurance in order to qualify for federal aid; but they don't expect to get all this. Sen. Lister Hill (D., Ala.), chairman of the Senate Labor Committee, may, at



WIDE WORLD

SENATOR HILL: On labor legislation, his unit expects light session.



COMBUSTIBLE VAPORS KEPT BELOW EXPLOSIVE LIMITS WITH CONTINUOUS ANALYZERS . . .

Delays in detecting LEL reduced

In a process using nine solvents with lower explosive limits ranging from 1.3% to 13%, a P-E TRI-NON* Infrared Analyzer has the job of reporting vapor concentrations continuously so they can be kept below 80% of the explosive limit.

The TRI-NON analyzer is sensitized to give an equal and linear response for each of the nine solvents. This linearity allows summation of the various combinations at each station regardless of the actual vapor concentration of any one component. Only an infrared analyzer using a selective detector can be sensitized in this manner.

One TRI-NON analyzes samples from six different points in succession along the process line at a speed of 30 seconds per point. Each point is checked every 3 minutes – often enough in this particular application to detect any dangerous change in vapor concentration. (Instrument response times up to 3.4 seconds for 98% of final value are standard.) The TRI-NON is the only infrared analyzer with sufficient speed and stability to cover so many sampling points safely.

In combustible vapor analysis, whether the system contains one or a mixture of solvents, the TRI-NON provides the best zero and range stability available. It does not run into trouble when non-hydrocarbon materials are present in samples. Since it does not burn in order to analyze, deposits do not form in the detecting element and flash-back protection is unnecessary. Maintenance problems are kept to a minimum.

When you specify continuous analyzers for your process streams, P-E alone has a complete line of instruments to choose from. Or let us develop a complete analytical control system for you. Nowhere else can you get the combination of chemical engineering and instrument know-how that you'll find at P-E.

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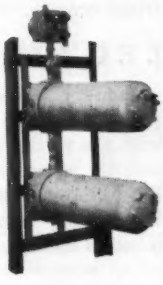

P-E TRI-NON Analyzers are available in a wide range of models and prices to meet all types of continuous analytical problems. They are rugged and dependable, expressly designed for use in the varied environments of a processing plant or refinery. For quick and easy maintenance, instrument components can be tested right on stream — without disconnecting.

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Labor Secretary James Mitchell's request, hold hearings for broader coverage under the minimum wage law, but otherwise the load of labor legislation looks to be a light one during this session.

•

Worker Capitalists: How many well-paid production workers at chemical process plants are building up stock portfolios these days? The number is rising, and one employer—The Texas Co.—has seen fit to circulate a memo saying that employees should give up any investments "in conflict with the interest of The Texas Co." This would appear to include the common stock of any competing firm, and the rule is being challenged by the Oil, Chemical & Atomic Workers (AFL-CIO).

•

Varnish Fume Claim Denied: The Maryland Court of Appeals has upheld the state's Industrial Accident Commission in turning down a workman's compensation claim based on alleged injury due to inhalation of varnish fumes. The claimant had worked for three days at breaking gilsonite into small pieces and putting those pieces into 200-gal. kettles for manufacture of varnish. A toxicologist testified that the young man's symptoms—lack of color, vomiting, coughing and spitting blood—did not come from his work, but might have been due to excessive use of alcohol or a heart condition.

•

Fringes Aren't Wages: In New York state, at least, the law recognizes a difference between fringe benefits and regular wages and salaries. The state's highest court has reversed two lower courts that had decided in favor of six truck drivers and their labor union in their suit for vacation pay after their employer went out of business. A 65-year-old state law makes it a crime to fail to pay wages after six days' employment, but the high court finds that this doesn't apply to fringe benefits.

LEGAL . . . . . .

Industry Consulted: More anti-pollution legislation is coming up this winter in various states and cities, with industry as one of the prime targets. But in Gov. Arthur Langlie's state of Washington, industry is being consulted as legislative proposals are being drafted. The state legislative council has appointed a 24-man advisory committee to help investigate air pollution problems in that state and to draw up suggestions for new laws. Among industrial members of the committee are representatives of Aluminum Co. of America, General Petroleum Corp., Bethlehem Steel Corp., National Assn. of Power Engineers, and Weyerhaeuser Timber Co.

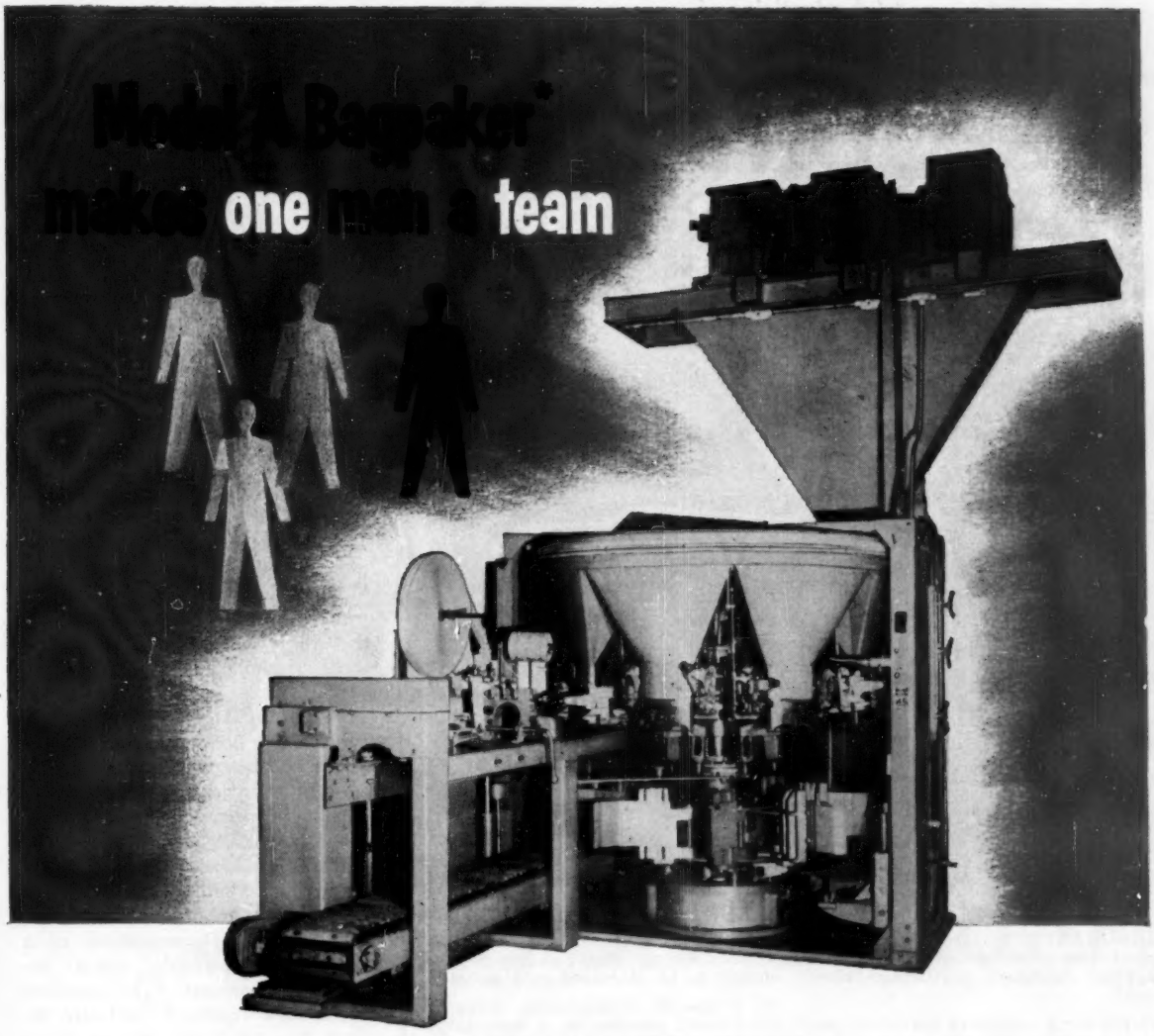
WIDE WORLD

GOVERNOR LANGLIE: In framing pollution bills, industry to take part.

Meanwhile, industry continues to be singled out for special attention in enforcement drives. At Louisville, Ky., Publicker Chemical Corp. has been given until April 1 to install fly-ash collectors at its butadiene plant there; and at Bartow, Fla., Solicitor Paul Johnson has ordered Polk County chemical concerns to stop polluting the Alafia River with phosphate wastes, or face prosecution in court.

•

Trade Secrets 'Out': A New Jersey chancery court has ruled that an employment contract forbidding divulgence of a company's trade secrets can't be enforced if those "secrets" have been "spilled." Gallowhur Chemical Corp. sued for injunctions to keep several former scientific employees from telling another company about Gallowhur's methods of dissolving phenyl mercuric acetate—one using ammonium salts with ammonium hydroxide, the other using alkanolamines with acids. The court refused to regard those techniques as trade secrets, pointing out that another Gallowhur chemist had already delivered a lecture on



The Model A Bagpaker® makes large tonnage bagging of free flowing materials a one man operation—and up to 350 tons can be bagged per 8 hour shift without overtime.

All the operator does is hang the empty bags on the filling spouts. Accurate weighing, filling, settling and sewing are fully automatic.

Engineered and manufactured by Bagpak Multiwall Bag experts, the Model A Bagpaker® is designed for reliability and durability. It can be depended upon to give years of service—and to pay for itself in as little as one year. If you are interested in the utmost in economy and efficiency in packaging bulk materials, you'll want to have all the details on this efficient machine. For complete information on how the Model A can fit into your packaging picture write to: K-17

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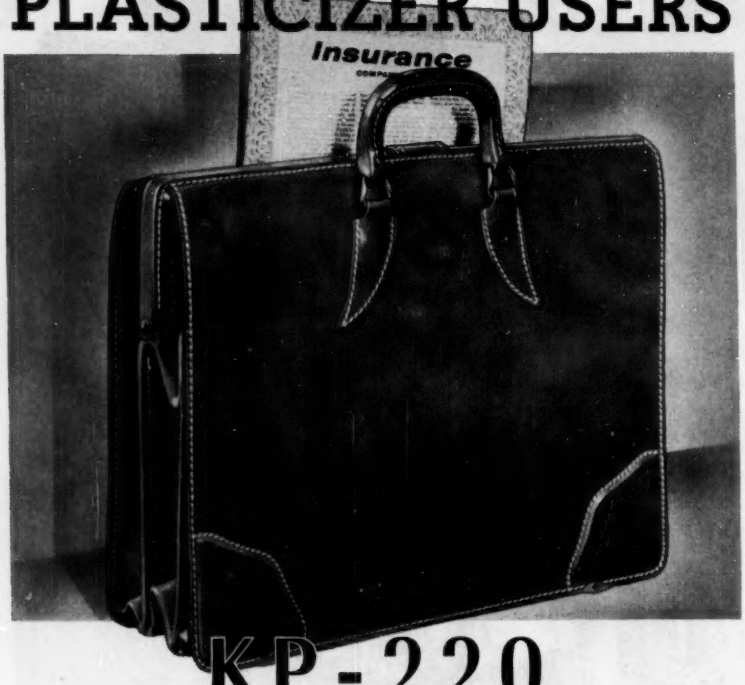

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If you use a secondary plasticizer you should select a primary to use with it that is capable of "holding" as large a percentage of the secondary as is possible.

You can not use the optimum amount of a secondary plasticizer if you don't choose a primary that has this "holding" property.

KP-220 offers you added protection against bleeding at your present primary to secondary ratio. It also allows you to substantially decrease this ratio without bleeding thus reducing the cost of your formulation. In certain formulations the use of KP-220 has allowed the ratio of primary to secondary to be decreased substantially.

In a specific formulation, using a chlorinated paraffin as a secondary, laboratory tests proved KP-220 to be the only primary tested among several commercial types that did not bleed when used in an amount equal to that of the paraffin. A sample containing 23.5 parts of KP-220 and 23.5 parts of a chlorinated paraffin secondary with PVC was tested for a period of 29 months and proved completely compatible after that time.

If you need added protection against secondary plasticizer bleeding and are interested in reducing the pound volume cost of your present formulation, you should evaluate KP-220.

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those processes before a professional organization.

An employer, the judge sums up, may not take liberties with his own secret. He "may not lightly or voluntarily hazard its leakage or escape and at the same time hold others to be completely obligated to observe it."

•

Not a Quitter: Despite last week's adverse ruling by the U.S. Supreme Court (*CW Business Newsletter, Jan. 14*), Interhandel says it'll keep plugging away on its seven-year struggle to get a court trial of its suit to recover 90% interest in General Aniline & Film Corp. "We still have six months in which to produce the remaining records," says Interhandel attorney John Wilson, and "substantial progress is being made toward release by the Swiss government" of many of the papers. Those papers, according to the U.S. Dept. of Justice, are the ones showing who controlled Interhandel.

•

Voided by Disclosure: The U.S. Patent Office Board of Appeals agrees with a patent examiner that an alcohol production process can't be patented because of prior disclosure through publication in a technical journal. The application in question had been filed by Eugene Lorand not quite one year after publication of a monograph—"The Thermal Decomposition of a Cumyl Hydroperoxide"—that described the process. "The appealed claims stand rejected," the board declares, "on the ground that the allowance of these claims would be inconsistent with the prior knowledge shown."

FOREIGN. . . . . .

Rayon/Japan: Japan's six leading rayon manufacturers will expand their plants, pushing up national output of rayon yarns to 230 million lbs./year, an increase of 27 million lbs. over 1955. Involved are the Teikoku, Toyo Asahi, Kurashiki, Mitsubishi and Toho firms, all located in Osaka.

•

Ammonia/Germany: The Krupp-owned colliery, Hanover-Hannibal, is to build a $5-million plant to produce 42,000 tons of synthetic ammonia annually.

•

Ammonia/France: Potasse et Engrais Chimiques will build an ammonia

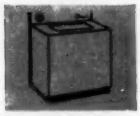
WIPE OUT FOAM PROBLEMS

with TRITON CF-10

This new non-ionic detergent answers the problem of excessive foaming in cleaning compounds. At the same time, TRITON CF-10 offers outstanding detergent properties. By blending it with alkaline builders and other detergents, you can now obtain both high detergency and controlled foam.

TRITON CF-10 can be used with excellent results in the following applications where controlled foam is important:

Automatic Dishwashing Compounds. In machine dishwashing excessive foam causes overflow, reduces the efficiency of washing and rinsing operations, results in streaking and spotting.



Automatic Laundry Detergents. Where the *right* amount of foam is necessary to promote effective de-soiling of the clothes and satisfactory removal of the soil.

Dairy Cleaning Compounds. For "in place" cleaning of pipe-line systems. TRITON CF-10 promises to simplify rinsing and will help eliminate germ-breeding residues.

Metal Cleaning. For washing and rinsing operations where too much foam may be the cause of a poor plating, pickling or priming job later on.

Many more applications will occur to formulators. TRITON CF-10 is now commercially available. Investigate its possibilities by requesting samples or information from Rohm & Haas representatives, or by writing us.

Chemicals for Industry

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B & I. . . . . .

plant at Grand Couronne near Le Havre. It is due to start operating in 1957. To finance the project, the company will raise its capital to $5.1 million.

•

Textile Fibers/Venezuela: Burlington Industries, Inc., plans to build a new South American plant at Valencia in Venezuela. It will process both natural and synthetic fibers.

•

Fertilizers/Greece: Hellenic Co., of Chemical Products and Fertilizers, Ltd., has increased chemical fertilizer output at its Piraeus plant from 60 to 100 tons/day, as part of a government program to stimulate food production.

•

Chemicals/Japan: The formation of export cartels for cement and glycerine has been approved by the Ministry of International Trade and Industry. The cartels, Japan hopes, will promote exports and stabilize prices.

KEY CHANGES. . .

Emil Schlittler, to vice-president and director, research, Ciba Pharmaceutical Products, Inc. (Summit, N.J.).

William B. Hume, to president, Silicone Division, Union Carbide and Carbon Corp. (New York).

Bernard R. Krashin, to president, Colton Chemical Co. (Cleveland).

Boyd Johnson, to vice-president The Carborundum Co. (Niagara Falls, N.Y.).

E. J. Bock, to associate director, marketing, Inorganic Chemicals Division, Monsanto Chemical Co. (St. Louis, Mo.).

M. H. P. Morand, to manager, coatings sales, Dow Chemical Co. (Midland, Mich.).

Rodney M. Vining, to assistant treasurer, Dewey and Almy Chemical Co. Division, W. R. Grace & Co. (Cambridge, Mass.).

Fred Sheldon, to manager, pulp and paper research and development, Becco Chemical Division, Food Machinery and Chemical Corp. (Buffalo, N.Y.).

Daniel Schoenholz, Chester A. Snell, Philip B. Ostrow, Lloyd Osipow and **Richard L. Moore,** to the executive committee, Foster D. Snell, Inc. (New York).

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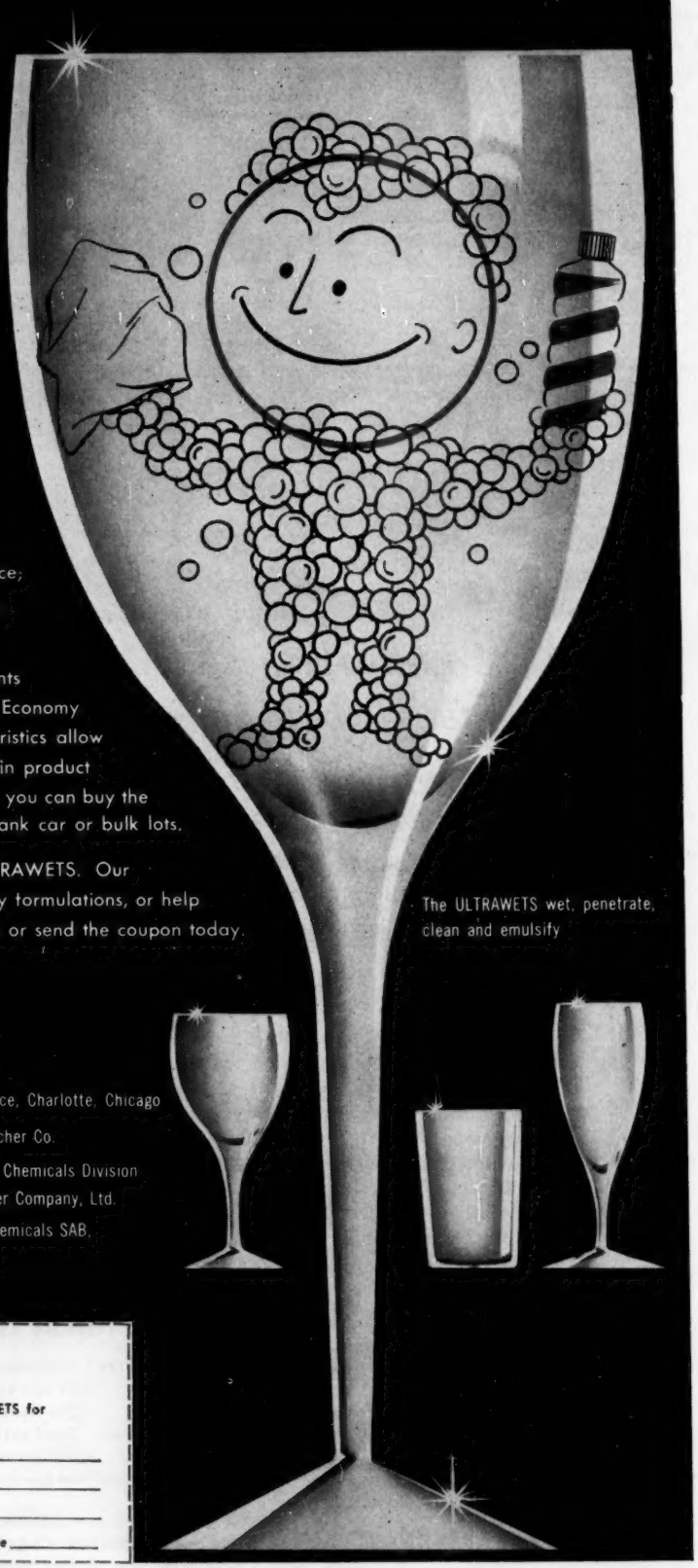

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CW Report

by James A. Newman

DRAWINGS BY GORDON DRAPER

Executive Development: Talent on Tap

Booming along, chemical companies—large and small alike—bid fair to run short on high-caliber executive material.

It is time to inventory available executive manpower, start building up reserves through management resources planning.

Here is how one company did it and how your company can do it:

In the time since World War II, the chemical process industry has spent $10 billion expanding and modernizing its plants and equipment. In the same period, it has spent almost nothing and done little for the development of its human assets.

The truth of the matter is that very few companies in any field have devoted as much attention to the inventory and use of human resources as they have to their physical assets. But the chemical industry has done even less about developing its executive ability; as a result, it's now faced with a severe shortage of executive talent, particularly at top and middle management levels.

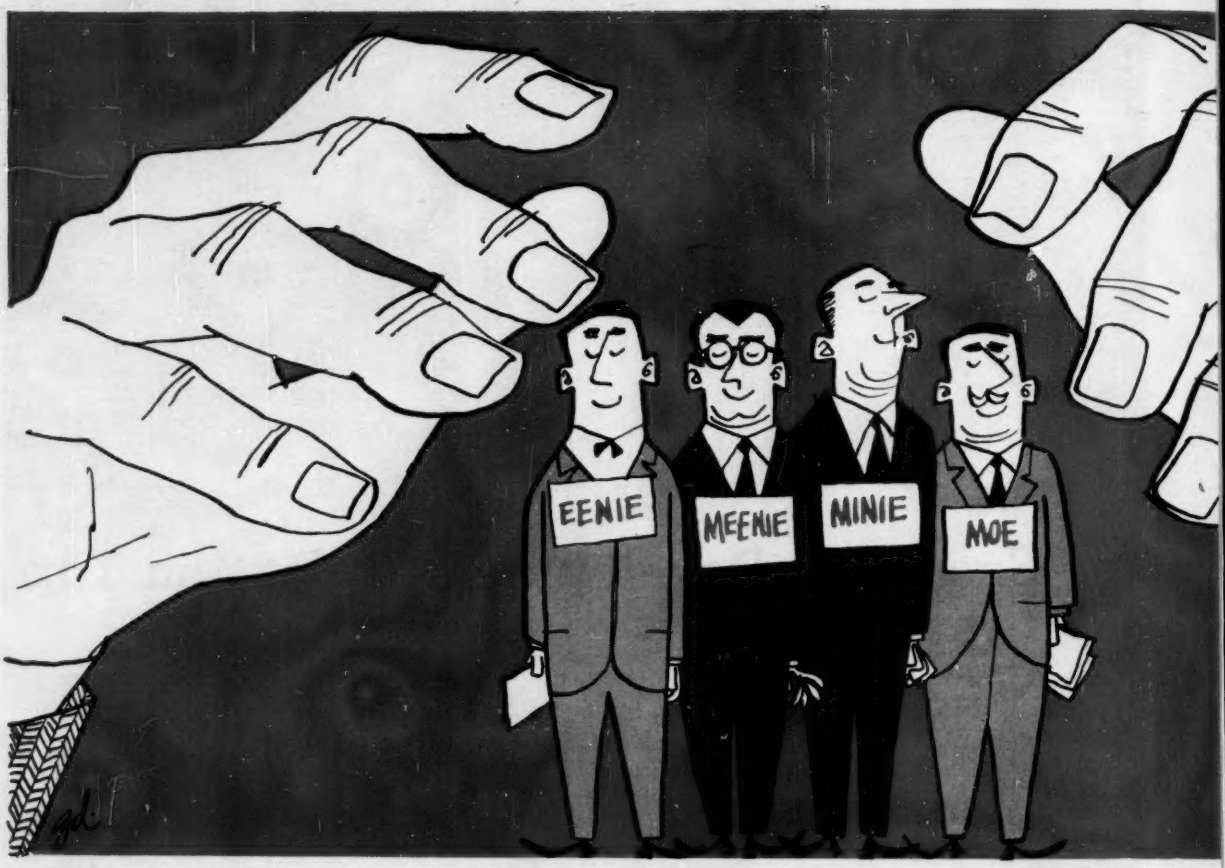
Prime Problem: An industry demanding high capital investment accentuates rather than minimizes this need for capable executive talent.* High capital investment means high

*In the chemical industry, it takes about $1.60 of capital investment to produce $1 of annual sales, whereas in manufacturing as a whole, only 55¢ of invested capital is needed per sales dollar.

Meet the Author

Shortly after leaving the Army Air Forces in 1945, James Newman joined the management consulting firm of Booz, Allen & Hamilton, in which he is now a partner. He was a prime mover in the development of his firm's management appraisal service, which has evaluated over 3,000 executives during recent years. One-third of the companies using this service are chemical processors.

A graduate of Massachusetts Institute of Technology (B.S. in Chemical Engineering) and University of Chicago (M.B.A.), Newman worked as a research engineer for American Rolling Mill Co. and sales director in Ingersoll Steel Division, Borg-Warner, before entering military service in 1942.



RULE-OF-THUMB executive development programs are not capable of meeting th

C W Report

break-even points; many chemical plants must operate at 80-85% of capacity to cover costs.

Recently, a $15-million chemical plant was completed and the final equipment was within two months of being installed. Suddenly the president asked, "How are we going to staff this plant? Who is going to run it?" Jerry-rig plans had been made, but no manager had been provided and no permanent organization planned. Results: a $300,000/month loss until an adequate manager was obtained; a six months' wait after that to reach the black ink. At least two other well-known chemical companies went through almost identical pains recently. It is reasonable to suspect that these cases are not exceptional in the industry.

Too, poor planning is very evident in the current wave of corporate consolidations. Often, before such consolidations occur, careful plans are made to "take care of" only the two or three top executives in each company. The merger is then effected, and each department of the resulting consolidation is usually headed by the executive of the biggest party to the marriage. Afterwards, top management often wonders why the combined companies are not quite as successful as their original components. In one case, the consolidated company actually operates at a loss, whereas both components had previously boasted long profit histories.

Premium on Youth: In large measure, the problem of maintaining adequate management resources within the chemical industry stems from its abnormal growth, which continually calls for more and more executives to staff newly created positions, to replace retiring personnel in others, to take over for those who die, to substitute for those who become ill, to fill in for those who leave.

A study of the age of executives in the eight largest chemical companies, undertaken as part of the research for this report, shows that chemical companies have cut down their dependency on older executives until now only 15% are over 65 years old (compared with 34% a decade ago). At the same time, the proportion of executives in the 56-60 age bracket has expanded encouragingly with the promise that the continuity and depth of management will improve (*see chart: Chemical Executives Are Getting Younger*).

Yet, despite results such as these, chemical companies still have a less favorable age distribution of execu-

mand of today's fast-growing process industries.

tives than companies in other fields. They still have a larger proportion of executives 71-80 years of age than other companies, fewer executives in the 46-60 age bracket.

What can management do to overcome the shortage of capable executives? Do they rob their nearest competitor of the unknown quantity who holds the title of the job they are trying to fill? Or do they merely assign the function to John Jones, currently swamped with his sales management function, because he has broad shoulders and can carry a little more responsibility?

The Answer: The only sound solution of the problem lies in an organized program of building management resources for the future. To be effective, such programs should consist of the following:

- Organization analysis and projection.
- Preparation of position specifications.
- An inventory of executive ability.
- An executive development program.

A considerable degree of latitude in carrying out these steps is desirable to fit individual company needs. Nevertheless, this approach will help insure a workable and successful development program. All four steps are essential.

A recent survey of management development programs indicates that several companies started their plans without first making a review of their organization. Those companies soon found they had no standard against which to appraise executive talent, to judge development progress, or to plan replacements. Other companies, profiting from those errors, carefully evaluated their organization before launching a management development program. Ford Motor Co., for example, spent three years on organization planning before starting its executive development program for middle management. Other examples where careful organization planning paid off: Esso Standard, Standard Oil of New Jersey and its affiliates (e.g., Creole Petroleum, Carter Oil and Interstate Oil Pipeline), Vick Chemical, Gulf Oil, and Koppers.

Whereto and How? Intelligent organization planning begins with a thorough understanding of where a company is going and how it proposes to get there. "We know what our objectives are," said one president. "We are going to continue to grow into a larger organization in the chemical industry and make money while we are doing it." These are wishes, not objectives. They are neither specific nor factual, nor do they answer the all-important—"how?"

To plan organization, a company must assay its position, determine that it will increase, say, 50% in five years, and decide whether this goal can best be reached by normal growth or by the acquisition of outside firms. Changing markets must be considered, of course, particularly if the company is rooted in basic industrial chemicals and now proposes to manufacture and distribute products nearer to the consumer market. These and many other real objectives will determine the organization structure that can best serve the company's needs. Not until this analysis is completed can sound plans be developed detailing the changes in the existing organization necessary to fashion the new working structure.

Furthermore, when making such changes, questions — deep, searching questions—must be asked about every segment of the present organization. To wit: Is it divided horizontally into the fewest possible levels consistent with effective distribution of authority and responsibility? Is the organization aligned horizontally to give effective control and direction to the major objectives and programs of management? Can positions be realigned more logically? Are all positions necessary?

Out of such analysis should come a set of time-phased blueprints of the best organization for today, tomorrow, two years from now, and five years from now.

Once organization planning discloses the relationship between positions and functions in a company, the next step is drawing up position descriptions to define the requirements of each position, the necessary executive qualifications to fill them. A thorough description should cover the functions of a position: (e.g., its responsibilities, authority, relationships and accountability), as well as its executive requirements (technical knowledge, experience, personal characteristics, organization ability, human relations skill and management abilities) in detail. Such position descriptions make it possible to measure executive personnel against position requirements. This puts the right man in the right job or, alternately, uncovers those areas in which an executive candidate needs further training and development.

Executive Inventory: Having made an orderly analysis of its organization and position requirements, a company is then ready to inventory its human resources. Executive appraisal is the foundation on which a sound management inventory is based. To be effective, this appraisal must be both practical and reliable.

In the chemical industry, especially, such appraisals must take into account the technical training of its executives. (A recent report of a survey of the Manufacturing Chemists' Assn. of 1,930 chemical executives, ranging from plant managers to board chairmen,

C W Report

shows that 57% of the group have degrees in science or engineering or both. Among manufacturing executives surveyed, 88% had technical degrees; among sales executives, 55%. There is little doubt that this emphasis on formal technical training of the industry's executives will continue.)

At the same time, other surveys show that the supply of young technologists will not meet the demand during the foreseeable future. Industry will have to be prudent in the use of its limited technical manpower if it is to keep pace with its anticipated growth. Each position must be examined in the light of its minimum technical requirements to avoid wastage of technical talent. Conversely, every technically trained man must be given the opportunity—and the on-the-job help required—to develop him to his maximum potential within the company. In each case, the evaluation must equate the man to the position.

Experience indicates that four appraisal methods must be woven into such an evaluation if it is to be successful. Less than this number has been found to enlarge the margin of error; more makes the program costly and difficult to carry out. Each serves as an independent measure, can be integrated later to confirm the total appraisal findings. Varied to fit individual company needs, these are the four basic appraisal methods:

- Analysis of experience.
- Appraisal by associates.
- Personnel tests.
- Planned interviews.

(To find how the evaluation works in actual practice, *see box: The Case of John Smith.*)

Squaring the Pegs: Once consolidated, the appraisal findings are then examined for each individual's strengths, weaknesses, and promotion potential. The areas in which each executive needs further training and understanding, to be able to carry out higher positions, are summarized. These summaries are then used to construct an individual development schedule for each executive, which will expand his executive abilities.

The total company program is formulated by combining the development needs of individuals into an over-all list of training requirements. In the case of Belleows Chemical Co.* (*see box: The Case of John Smith*), to satisfy these requirements the company initiated the following remedial program:

- Job rotation.
- Outside academic courses.
- Internal training classes.
- Counseling of individual personnel.
- Organizing of committee and project activity.
- Scheduling of senior executive coaching assignments.

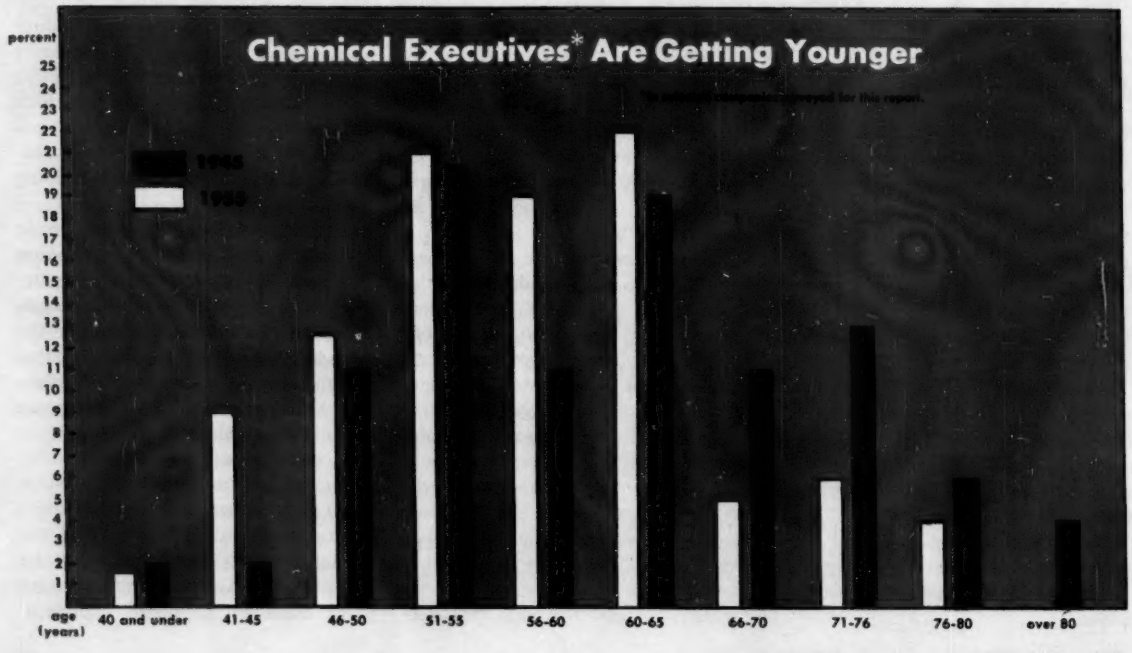
The industrial relations director and his assistant in charge of executive development arranged all these activities; different operating executives handled most of the actual personal contacts.

Inside and Out: Job rotation schedules were worked out individually with each department head. The industrial relations department and the operating executive listed positions open to job rotation, the qualifications or capabilities required to fill them, the urgency of development on the job in individual cases, and the operating efficiency of the department.

The handling of job assignments was greatly facilitated by the use of a replacement chart (*see box: Brown vs. Smith*) constructed from the appraisal findings. It showed when job vacancies would occur and which potential candidates might fill them.

The industrial relations department

*Name has been changed.



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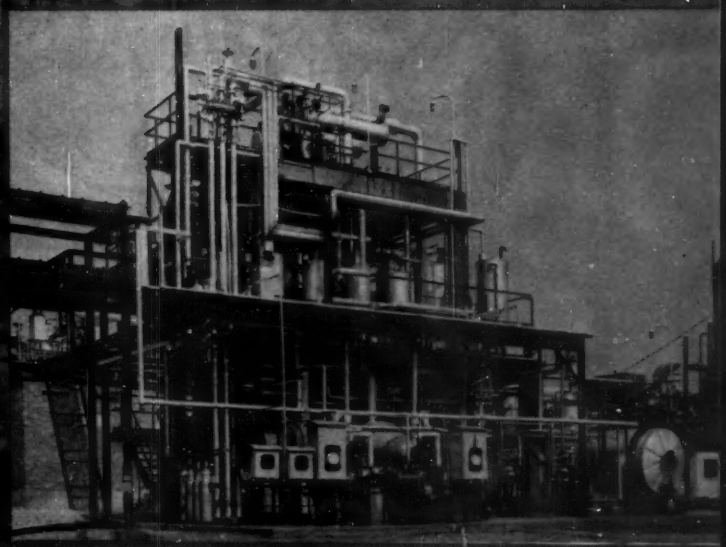

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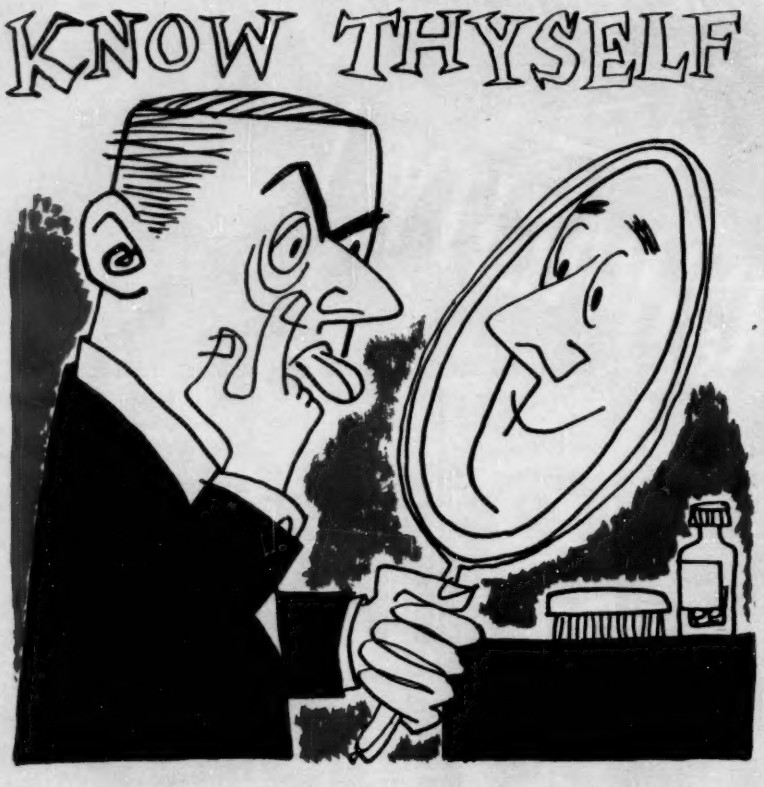

CORPORATE SELF-ANALYSIS is the first step in intelligent planning.

C W Report

next examined all individual development schedules, tallied the types of academic courses that had been recommended, and then surveyed educational facilities in nearby areas.

Adequate courses were found for all the technical subjects and most of the general business administration subjects. The industrial relations department advised individuals in the development program to register for the necessary courses, and the company paid the tuition of those who attended. The available courses in production control and business organization and administration were inadequate, so these two courses were organized and taught within the firm.

The production control course, closely geared to the company's peculiar production control problem, was taught by an able man in the company's production control department. For the course on business organization and administration, a management consultant with broad background in organization planning, management controls, and administrative techniques was called in.

In addition, the company organized a seminar series designed to broaden the trainees' acquaintance with various aspects of company activity. Top executives from each department discussed the objectives and policies within their departments, detailed the programs designed to carry out these objectives. The seminars usually began in lecture form, using as much visual material as possible, ended in a discussion period in which members not only asked questions but also made suggestions. In fact, the sessions became a fruitful source of new ideas.

Getting Through: Next, in order, came the counseling phase of the development, one of the most important. Belleows Chemical soon found that its appraisal findings were of very little value until they had been communicated to the individual who had been appraised.

But to be effective, the company discovered, this communication must meet two conditions: the man must be told of his total abilities and a real appreciation shown for his strong talents and their potential use. In this perspective, the individual can better recognize areas in which he needs improvement. The second condition is that the supervisor must achieve an identification with the individual so that the individual feels his supervisor has his personal interest at heart. Development then becomes something that both will want to work out together.

Belleows Chemical soon learned that it could not turn this delicate task over to its executives without first giving them some intensive coaching in interview techniques. The top executives naturally felt they were already pretty good at handling people. But by the time the counseling sessions were finished, almost all were convinced that they would have been on treacherous ground without such training in counseling.

The top executives then went over the appraisal findings with each man under them and counseled him on his development. Following that, counseling training sessions were extended to the second level management to prepare them for carrying the appraisal and development program down the line. This training in counseling techniques followed the appraisal the individual received of himself but came before he communicated appraisal findings to others under him. This was done deliberately to prevent the individual who was being appraised from taking a critical attitude of his superior's counseling technique.

By the time each individual on the management staff had been through the training session on counseling, and had been on the receiving end of one appraisal and development interview and on the transmitting end of several more, he had developed greater skill in dealing with others. The human relations skill and sense of harmony within the organization improved, and the management development program got off to a favorable start.

The Big Picture: To provide the trainees with experience in committee and project activity, several junior executive committees were organized to operate as subcommittees of the senior executive group. When senior executive committee meetings en-

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countered subjects requiring further fact-gathering and study of alternatives, the problems were turned over to a junior executive committee for investigation and recommendations. Thus, the younger executives gained an appreciation of management problems, and the senior officers received assistance on matters that would otherwise have taken considerably more time.

In addition to committee activity, individual projects—such as compiling a policy manual—were used to help fill out the experience of management personnel. In some cases these projects were carried out under one of the junior executive committees as the fact-gathering phase of their assignment. More frequently the work was assigned under the supervision of a senior executive officer.

Another phase of the senior executive coaching assignments was the tutoring of young executives from other departments in the planning phase of program development. When the sales department was developing a new advertising campaign, for example, the chief sales executives requisitioned a young man from the production department and another from the finance department as observers. The senior executive gave the background on the program to be developed, why it was needed, what it was intended to do, what its problems were, and what alternatives seemed possible. He invited comment. He gave a full explanation of the reasons for his decisions and the final program as it developed. Similar coaching assignments were held on major projects throughout the firm.

Cashing In: After its development program had been in operation for two years, Belleows Chemical had more ready replacements for executives than it had ever had before. At the same time, management personnel had a wider perspective on total company operations in their daily work; hence decisions became better. But perhaps the most significant benefit of all was that the senior executives were themselves developed as they sought to develop their successors. In fact, the entire company became more sensitive to handling its human resources, and a new sense of unity appeared.

In addition, out of the appraisal and development came an ability to plan for management succession—one of the most critical and difficult tasks of business. All in all, the appraisal and development program enabled Belleows Chemical to inventory its manpower, plan its development and have ready replacements backing up each key executive position (*see box: Brown vs. Smith*).

For Large and Small: Management resources planning applies equally well to both the small and the large chemical company. Actually, the small company has even more to lose by neglecting its management resources. It can less afford the luxury of a weak or doubtful performer at executive levels than its larger competitor. One death or unplanned-for retirement in top management can have even greater impact on over-all operations than the loss of the entire top management of a division in a big company. Indeed, many an acquisition of a small company by a large one has happened because the small company has literally run dry of executive talent. Often, the very men who founded and built the organization neglected, or were indifferent to, the company's prime raw materials problem—its executive manpower.

Successful management resource planning in the small company will differ somewhat in its mechanics from that employed in the large company, but the principles remain the same. The prime requisite is that the planning be done by a group instead of an individual, regardless of ownership considerations. Such an approach minimizes the dangers of favoritism and the ever-present "blind spots."

Equally important, the group must have the authority and the courage to implement its plans. It is better that the problem of "hurt egos," frequently resulting from replacement steps, be anticipated before-the-fact than met in frantic or embarrassed fashion after-the-fact. The disgruntled research director or sales manager who leaves the small company, taking his ideas or accounts with him, creates a greater proportionate void than his counterpart leaving the large company. For this reason alone, the small company should give considerable thought and energy to the development of those executives who, with the exception of one or two corrigible weaknesses, are top-management timber.

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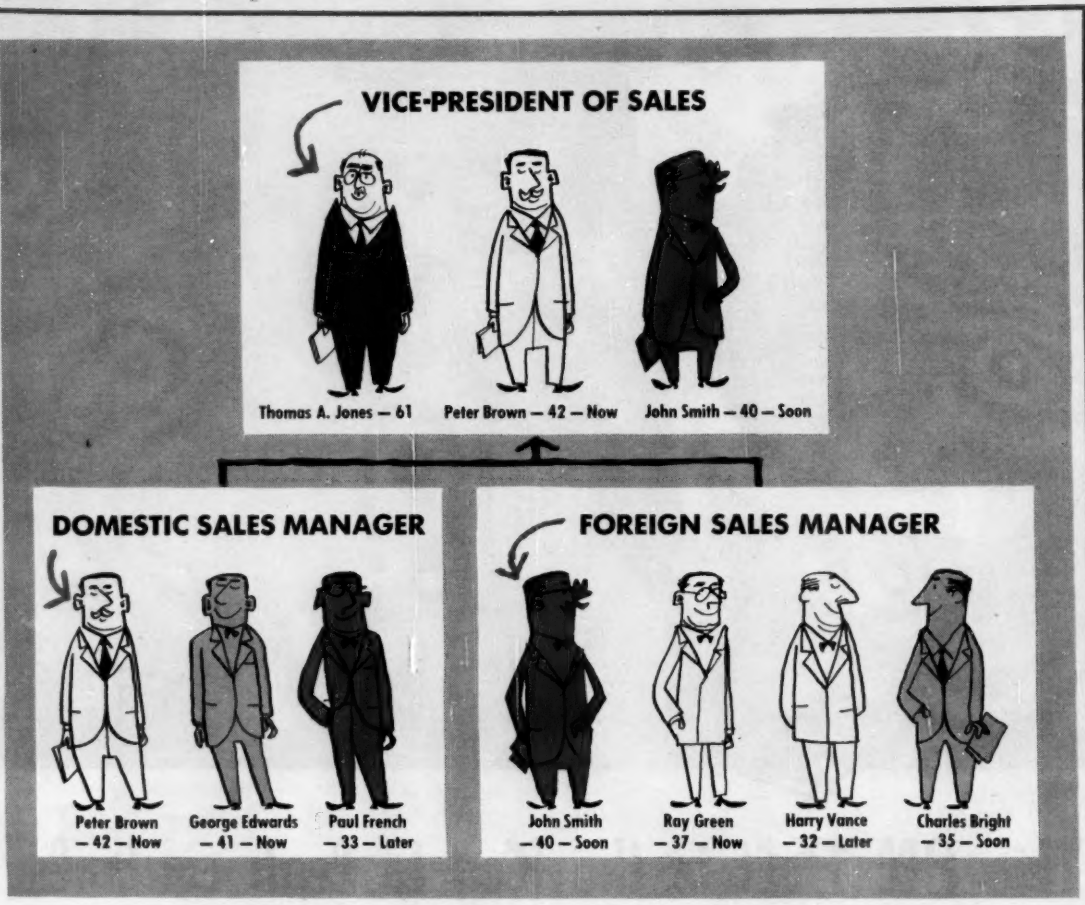
VICE-PRESIDENT OF SALES
Thomas A. Jones — 61
Peter Brown — 42 — Now
John Smith — 40 — Soon
DOMESTIC SALES MANAGER
Peter Brown — 42 — Now
George Edwards — 41 — Now
Paul French — 33 — Later
FOREIGN SALES MANAGER
John Smith — 40 — Soon
Ray Green — 37 — Now
Harry Vance — 32 — Later
Charles Bright — 35 — Soon

C W Report

Brown vs. Smith

One of the most significant achievements to result from a well-planned executive inventory is in the Replacement Chart. This greatly facilitates job handling, enables management—at a glance—to plan executive succession. Here is one small section (three positions in the sales department) of Belleows Chemical Co.'s chart and what it means:

Red indicates the man has the potential ability to be president; white, that he has potential for vice-president; gray, that he can be promoted one position level; and black, that he is presently at his ceiling. The timing of advancement appears alongside the man's name and age, showing whether he can be promoted now, soon or later.

The chart indicates that the present incumbent of the position, vice-president of sales, is Thomas A. Jones, age 61. He is satisfactory in the position, but possesses no promotional possibilities beyond it (indicated by the black color). Moreover, Mr. Jones will retire in four years; hence, plans should shortly be made to fill the position. There are two candidates: Peter Brown, domestic sales manager, and John Smith, foreign sales manager (*see box: The Case of John Smith*).

Red Takes White: Peter Brown is ready for promotion and (as indicated by the white area around his name) is capable of performing the duties of vice-president of sales. But even if adequately developed, Peter Brown does not have quite the potential that John Smith has. Smith is potentially a man who could be president, although he is

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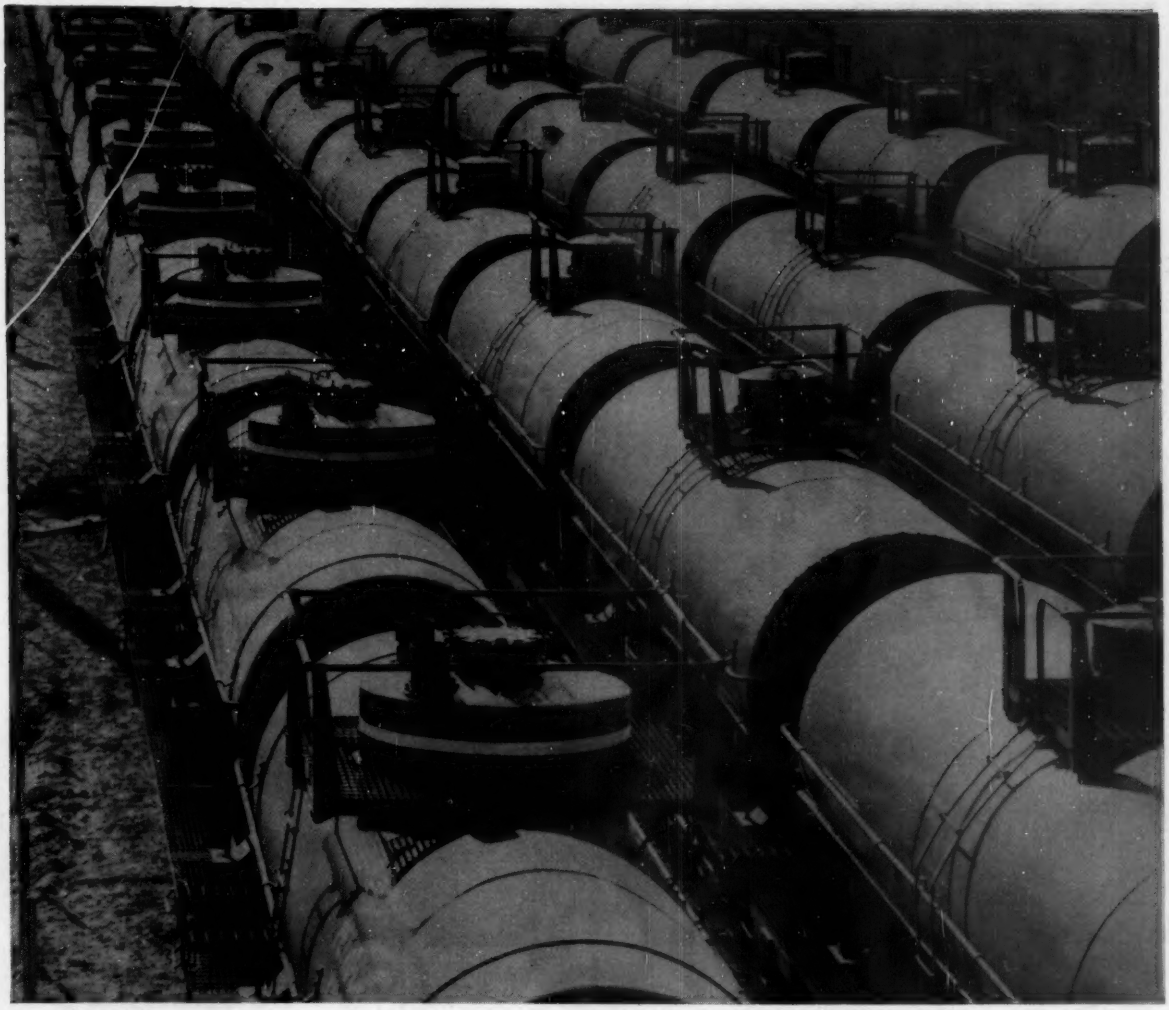

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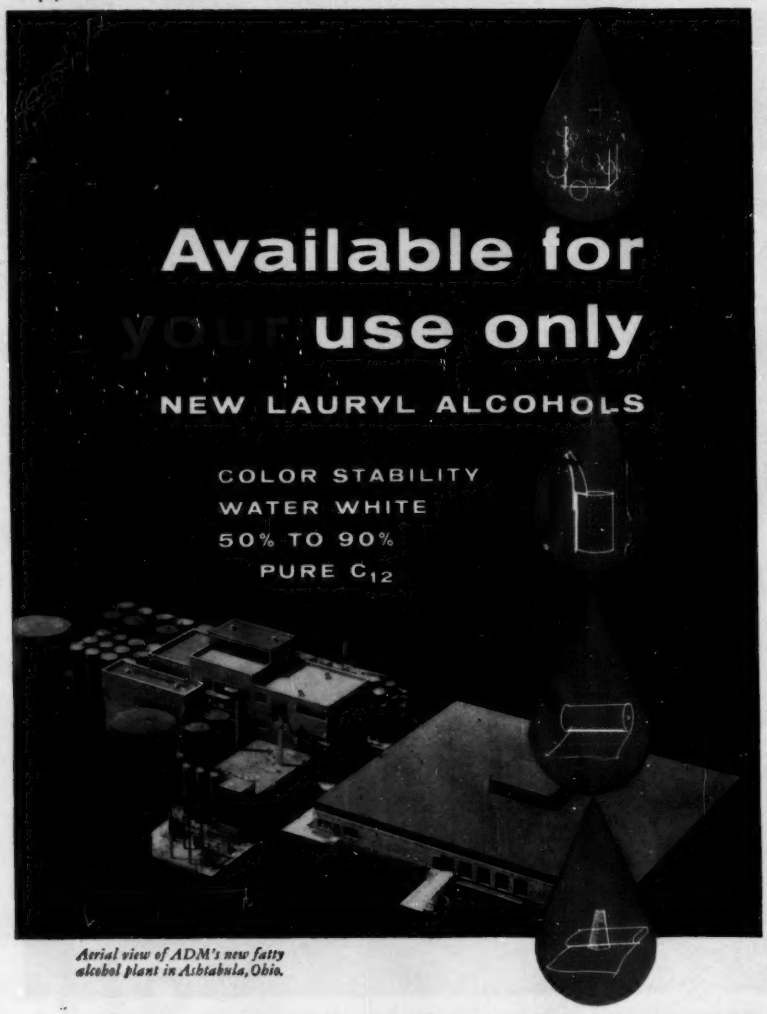

Aerial view of ADM's new fatty alcohol plant in Ashtabula, Ohio.

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Hydrogenated and Distilled Fatty Acids and Stearic Acid . . . Hydrogenated Vegetable, Fish, Sperm Oil and Tallow . . . Hydrogenated Castor Oil . . . Stearyl, Cetyl, Oleyl Alcohol . . . Sperm Oils and Spermaceti . . . Behenic Acid . . . Erucic Acid . . . Hydroxystearic Acid.

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Six new lauryl alcohols—ADOLS 10, 11, 12, 13, 14 and 15—are now available from ADM's Ashtabula, Ohio, plant. All of them are water white, non-corrosive oily liquids with a mild fatty odor. And all of them have been developed for your use since ADM does not consume any of its Chemifats.

Uses of these new Adol Fatty Alcohols are countless . . . as raw material for non-ionic detergent concentrates and anionic-type detergents; as a basis for cationic quaternary ammonium surfactants; as anti-foam agents in paper, leather and textiles; as pour-point depressants and viscosity-index improvers for lubricating oil additives.

These new ADM Fatty Alcohols are available now . . . in tank-car and LCL quantities. Write on your letterhead for samples.

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CHEMICAL PRODUCTS DIVISION
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C W Report

Continued from p. 46

not immediately available for promotion because of his development needs.

Peter Brown has a ready replacement in George Edwards who could handle the job of domestic sales manager immediately, but probably has no further potential. Brown also has an able young replacement in Paul French, who might ultimately, with development, assume the presidency or a top executive position. But French is relatively young and needs considerable broadening.

For the position of foreign sales manager, John Smith has a ready and able replacement in Ray Green, who could take over that job and ultimately become vice-president. Similarly, Harry Vance has the same potential but is young and needs development. Charles Bright could be advanced soon with some further training but probably not beyond the position of foreign sales manager.

About this time, Belleows Chemical finds it necessary to staff a new phenol division (in reality a subsidiary) with a sales executive who would bear the title of vice-president. It decides to place Peter Brown in this position because he is able and ready for the new position, and because the reassignment will be a promotion for him. John Smith will be transferred to the position of domestic sales manager in Peter Brown's place. This will enable the company to carry out the development program for Smith and broaden his sales background (*see box*: *The Case of John Smith*). At the same time, Ray Green will be promoted to foreign sales manager because he has all the qualifications and is immediately available for promotion.

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flower with a **KNOCKOUT** *punch*

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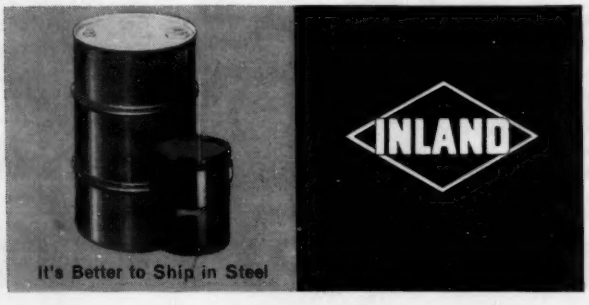
**the right container, with the right lining for your product*



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C W Report

The Case of John Smith

John Smith, age 40, foreign sales manager for Belleows Chemical Co., was being considered for promotion. But first, he had to pass through an organized personal evaluation.

It started with an analysis of his experience. This showed that his technical education was adequate but his work experience had been relatively narrow and confined largely to selling. He had been an effective personal salesman and had risen rapidly as a sales manager. Most of his sales experience had been in foreign markets. His salary increases had been rapid, and internal company ratings in

I APPRAISAL OF POSITION PERFORMANCE

A. SPECIFIC

Position performance is made up of the following factors. Indicate your judgment on each factor by checking the most applicable degree.

DEFINITIONS OF DEGREES

GOOD – Shows superior ability – in excess of job requirements
AVERAGE – Meets the requirements of the position
POOR – Below position requirements

FACTORS		GOOD	AVERAGE	POOR
1. JOB KNOWLEDGE	Understanding of all aspects of the position	X		
2. PLANNING	Looking ahead. Developing programs and specific work schedules		X	
3. ADMINISTRATION	Organizing own work and that of others. Delegation, follow-up, control of job activities			X
4. ACCOMPLISHMENT	Effective use of time. Amount of work produced. Application of abilities to the position		X	
5. QUALITY	Accuracy and thoroughness. Adherence to instructions, standards, and policy			X
6. INITIATIVE	Self-starting ability. Prompt to take hold and follow through with a minimum of supervision and direction	X		
7. DRIVE	Ambition and energy. Ability to fulfill work requirements under rigorous conditions. Basic urge to get things done	X		
8. DEPENDABILITY	Meeting schedules and deadlines. Carries out delegated assignments correctly and efficiently	X		

B. COMPARISON

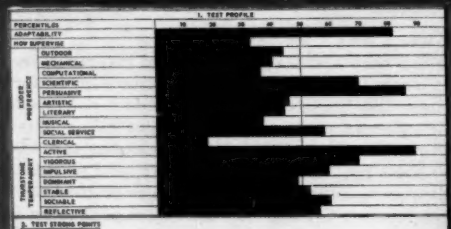
Circle the numbers of the person's two strongest factors – (1) 2 3 4 5 6 (7) 8
Circle the numbers of the person's two weakest factors – 1 2 (3) 4 (5) 6 7 8

C. GENERAL

Consider the adequacy of the person's position performance against the requirements of the position. Indicate your judgment by checking the most applicable statement:

(X) Job performance exceeds position requirements
( ) Job performance just about meets the position requirements
( ) Job performance is marginal or below position requirements

I. TEST PROFILE



2. TEST STRONG POINTS

Mentality, scientific and persuasive ability, interested in others. Very active and vigorous, a stable personality.

3. TEST WEAK POINTS

Poor knowledge of supervision, low interest in detail, somewhat impulsive.

IV PERSONNEL INTERVIEW

1. INTERVIEW STRONG POINTS: Pleasing personal appearance, high verbal ability, good mental organization, persuasive, quick mind, nice personality.

2. INTERVIEW WEAK POINTS: Acquaintance with company activity limited mostly to selling, impatient with people who cannot get things done.

3. INTERVIEW SUMMARY: Capable of assuming company presidency, but needs further experience and planned development.

DEVELOPMENT SCHEDULE

BELLEOWS CHEMICAL COMPANY

IDENTIFICATION:

Name of Employee John Smith Age 40 Sex M
Position Foreign Sales Manager Department Sales
Length of Service in Company 8 Years In Present Job 3 Years

QUALIFICATION FOR OTHER POSITIONS:

(1) Position Domestic Sales Manager Department Sales
Training Needs None

(2) Position Vice President of Sales Department Sales
Training Needs Experience of one to three years in Domestic Sales Management. Improved supervision of personnel. Better knowledge of organization of company. Broader knowledge of company operations. Experience in planning and carrying projects to fulfillment.

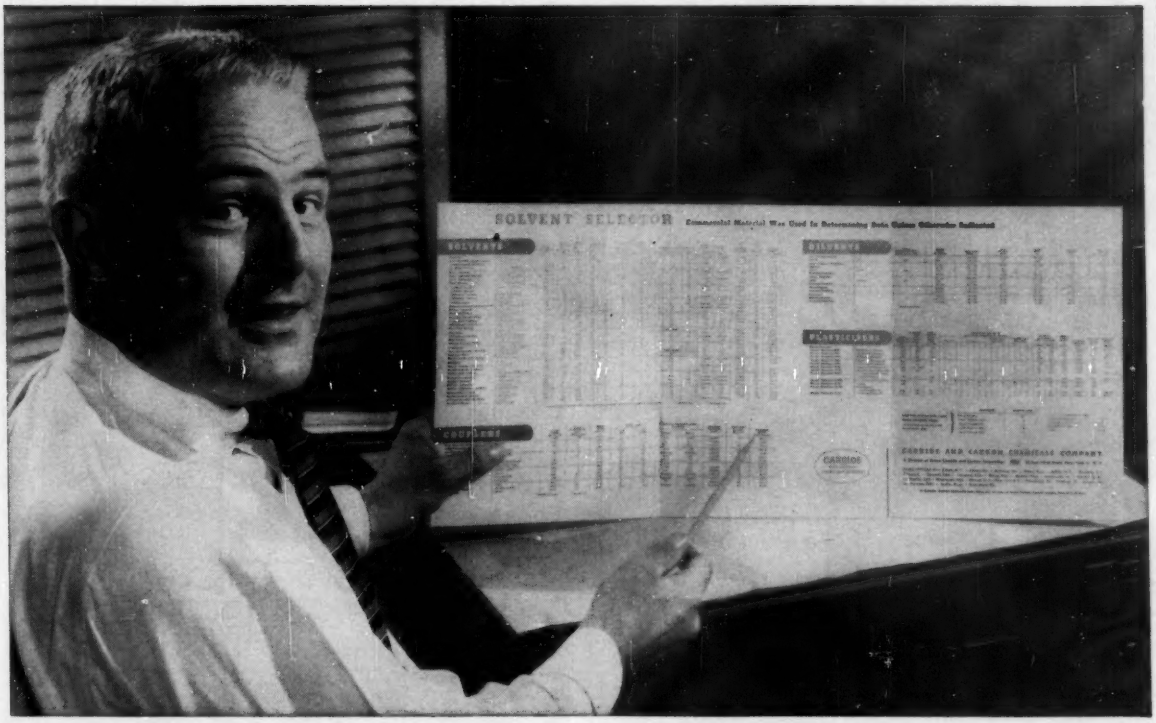
(3) Position President Department
Training Needs Full knowledge of company operations. More experience in executive teamwork. Experience in planning programs for company development. Improved knowledge of financial management.

SCHEDULE OF DEVELOPMENT

	Type	Begin	Complete
1.	Transfer to domestic sales manager	Nov. 1, 1955	Mar. 1, 1958
2.	College course in personnel management	Jan. 15, 1956	June 15, 1956
3.	Counselling on handling personnel	Nov. 1, 1955	Periodic
4.	Junior executive committee	Nov. 1, 1955	Nov 1, 1956
5.	Compiling policy manual for company	Jan. 15, 1956	June 15, 1956
6.	Graduate school of business administration	June 15, 1956	Sept. 15, 1956
7.	Special project - new product development committee	Oct. 1, 1956	June 1, 1957

READY FOR PROMOTION

Position Ready Vice President of Sales March 1, 1958
Department Position Open Sales October 1, 1958



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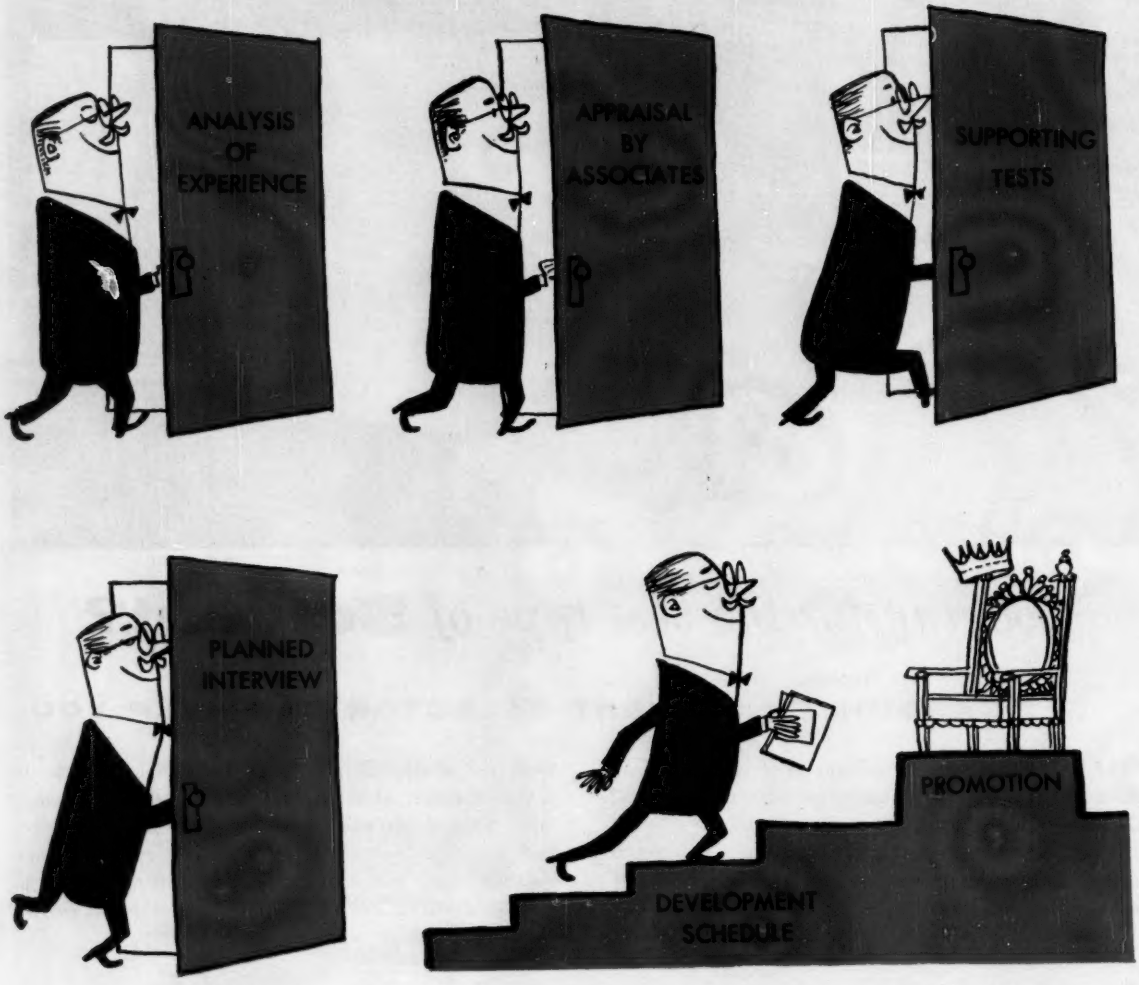

C W Report

the past had been high. His promotions in position level had been faster than usual.

Smith had been active in a local export association and had been elected to its board of directors. He had participated as a vice-chairman of a large Community Chest fund drive. Other than this, his outside activity had been limited—partly due, perhaps, to his heavy work load and a certain amount of travel both at home and abroad.

Appraisal by Peers: Then, for objectivity and accuracy, five business associates were asked to appraise Smith on key factors related to his job. Each made an independent and confidential evaluation. These appraisers were chosen for their knowledge of Smith from positions above and beside him in the sales and other departments in which he had worked. The objective was to look at Smith from every angle to eliminate "blind spots."

The appraisers were forced to make a choice on Smith's strong points and weaknesses (*Chart p. 50*). They were asked to identify his two strongest factors and his two weakest factors. This required them to go back and make two factors stand out above average and two below average. In short, appraisers were forced to make a definite judgment. Finally, they were asked to check Smith's position performance to see whether it exceeded the position requirements, just met position requirements, or fell below requirements. Smith was also rated by his associates on mental qualities and human relations—increasingly important factors at higher management levels.

The five appraisers agreed substan-

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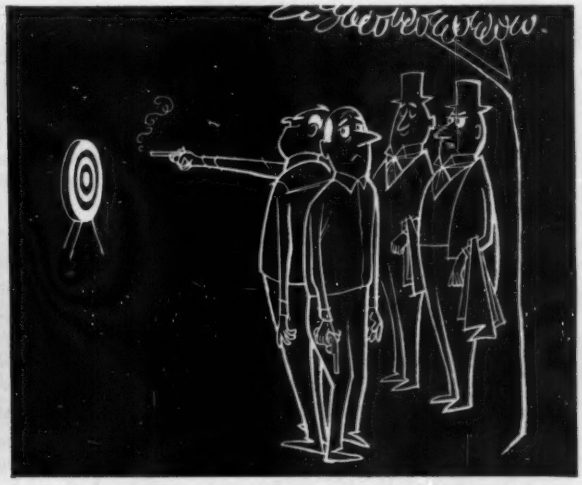
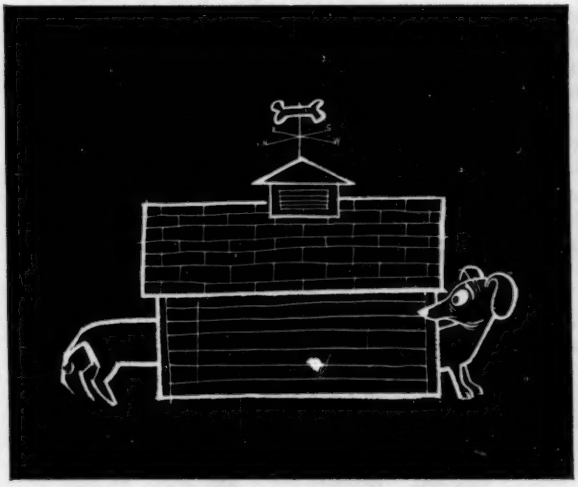


PRE-TESTING IN PILOT-PLANT OPERATION TO ASSURE PERFORMANCE



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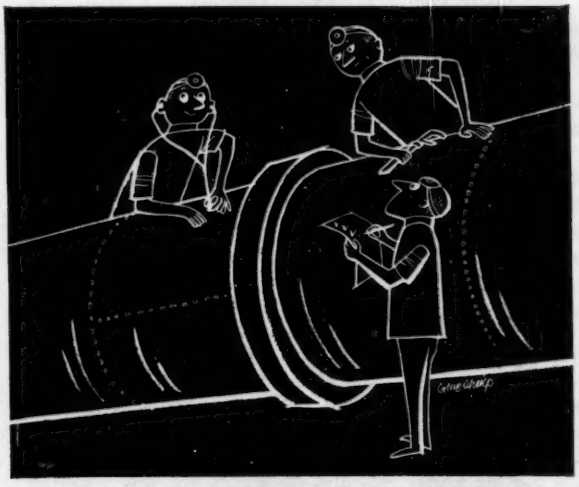

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tially that Smith's strongest points were his job knowledge, his initiative and drive. Turning to his weaker points, they questioned to some extent his thoroughness in following standards and policies, his facility at delegating and controlling work under him.

As to mental ability, his business associates felt that he was exceptionally alert and flexible. They believed he was very creative but did not always follow through in his thinking, for his mind tended to work quickly and move on to new ideas at a rapid rate.

On the human relations side, his associates felt he was remarkably poised and self-controlled. His attitude towards the company and others was good. They agreed, however, he was weak on supervision and the training of subordinates.

Over-all, his business associates felt he probably had a promotional potential to the presidency of the company if he were properly developed. They felt that his main training needs were in the handling of subordinates under him, in planning and carrying projects to completion, and in a broader outlook of the company's activities.

Appraisal by Tests: Supporting tests were used in four areas: basic mental ability, interests, personal characteristics, and knowledge of supervisory principles. Results were compared with company norms, or the scores of other individuals within the organization. The tests were used only to confirm and explain other appraisal findings, not as a sole appraisal technique.

The test profile confirmed Smith's high mental ability (*Chart p. 50*), showed that he had a strong persuasive ability and considerable scientific aptitude, and indicated he was an extremely active and vigorous man with a stable personality who appeared to have a basic desire to help and work with others. The results also showed that he tended to be impulsive (in the sense of acting quickly and then moving on to another problem) and that he had poor knowledge of proper supervisory principles. It is interesting to note that Smith's quickness or impulsiveness and his poor knowledge of supervision were confirmed both by the tests and by associates' appraisals.

A planned interview was arranged with Smith to balance out and integrate the total appraisal. It was also intended to provide facts not obtained elsewhere (e.g., personal appearance, personality, mental organization and fluency), as well as to clear up queries raised by other findings.

The interview indicated that Smith had a very pleasing personal appearance, a high verbal ability and good mental organization. Other observations: His job knowledge was outstanding. He was extremely persuasive and had an attractive personality. His mind worked quickly and his observations were acute. He tended to grasp a situation quickly and to jump interestedly from one subject to another. His interests appeared to be fairly broad, but his acquaintance with company activity centered almost wholly on selling. He showed some impatience with people who could not "get things done," as he put it. He seemed to feel that it was up to the employees to grasp ideas with the same quickness as he did, rather than his task to instruct and supervise them.

The Findings: The evaluation of Smith indicated that ultimately he could probably advance to the presidency. To do this, he needed further experience and planned development. The qualities that particularly commended him to a high executive position were his unusual drive, mental grasp of situations, acute observation, persuasiveness, and general ability to get things done. But, to rise to a high executive position, particularly the presidency, he needed to know more about company operations, more about supervision of people; and he had to be schooled in a more thorough, less impulsive approach to problems.

Because of his high adaptability, it was believed that Smith could overcome these moderate shortcomings through training in personnel management, experience in company operations, and through practice in carrying out long-term projects. (It was decided that the impulsiveness was not wholly a disadvantage because it contributed to his decisiveness and drive, which are important in a high executive position.)

The appraisal, then, gave management a list of John Smith's strengths and weaknesses, his advancement potential, the position he seemed most eligible to fill and the training and development necessary to qualify for that position.

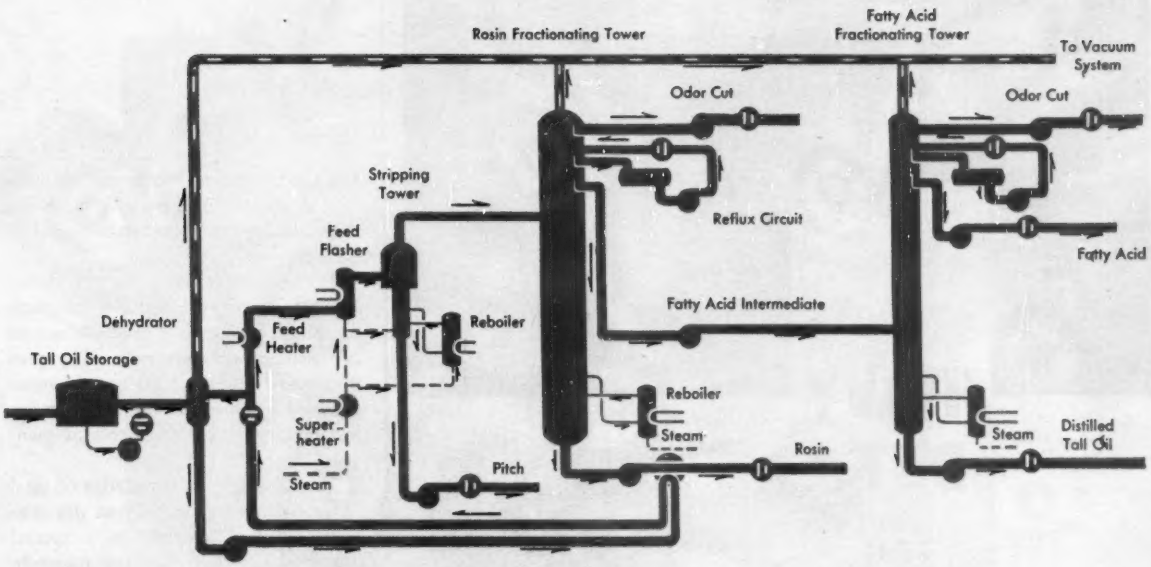
Most important, it yielded related results, thus permitted management to accumulate appraisal findings, assemble confirmed facts, and to drop isolated findings from consideration.

Taken together with similar appraisal findings on all management personnel within Belleows Chemical, appraisal proved to be an effective tool for inventorying the company's executive talent and laying the foundation for the management development program.

Further Grooming: The next step was drawing up a development schedule from the appraisal findings (*Chart p. 50*). This identified Smith, his position, length of service, the positions for which he was qualified, or could soon become qualified. It showed, for example, that Smith could be placed in the position of domestic sales manager immediately with no further training needs. To become the vice-president of sales, however, he would need from one to three years in domestic sales management to round out his knowledge of the company's product line and its distribution system.

With these development needs in mind, a schedule of his individual development program was constructed. Plans were made to transfer him to the domestic sales manager's position to provide, by job rotation, the necessary additional sales experience he needed. At the same time, he was advised to enroll in a course in personnel management to learn more about supervisory principles and employee handling.

Periodic counseling sessions with Smith were planned to help him, on an individual basis, develop skill in personnel supervision and to temper his impulsiveness with prudence. He was placed on a junior executive committee, whose function was to work out administrative improvements for recommendation to the senior officers of the company. He was given an individual project assignment, under



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C W Report

the supervision of the executive committee, to compile a policy manual for the company and to recommend policy changes.

For the longer view—the presidency—tentative arrangements were made for Smith to attend a graduate school of business administration. The purpose was to broaden his general management abilities and give him more insight into the planning role of management.

To round out his knowledge of total company activity on product development, he was assigned to a special project committee including research, engineering, and financial representatives. The function of this committee was to develop an adequate plan for research and testing of a new product, to examine production problems in its manufacture, to study capital equipment and financing requirements, as well as to test market acceptance.

With this schedule of activities for the development of Smith, it was believed that he would be ready within about three years, say by Oct. 1, 1958, to assume the position of vice-president of sales. He would at the same time be acquiring much of the additional background knowledge needed for the presidency. Naturally, no particular plans were made for the presidential position, because there were several promising candidates. Smith's final test of competence for the presidency would be based on his handling of the position of vice-president of sales, and upon his continued development while in that position.

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Dilution ratio with Toluene	1.8
Evaporation rate (n-butyl acetate = 1.0)	0.02
Flash point, Cleveland Open Cup, °F	205
Pounds/gallon, 68°F	9.2
Refractive index, $n_D^{20°C}$	1.4150
Solubility in water, % weight @ 20 C	16.4
Solubility water in, % weight @ 20 C	7.0
Specific gravity, 20°/20 C	1.1063
Vapor pressure @ 20°C mm Hg	0.25
Viscosity, centipoises @ 20 C	2.86
Viscosity, 10% 1/2 second nitrocellulose solution, centipoises @ 25°C	444

specifications

Specific gravity, 20°/20°C	1.103-1.109
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Ester content, % minimum	97
Acidity, as Acetic, % weight, maximum	0.15
Color, APHA	15

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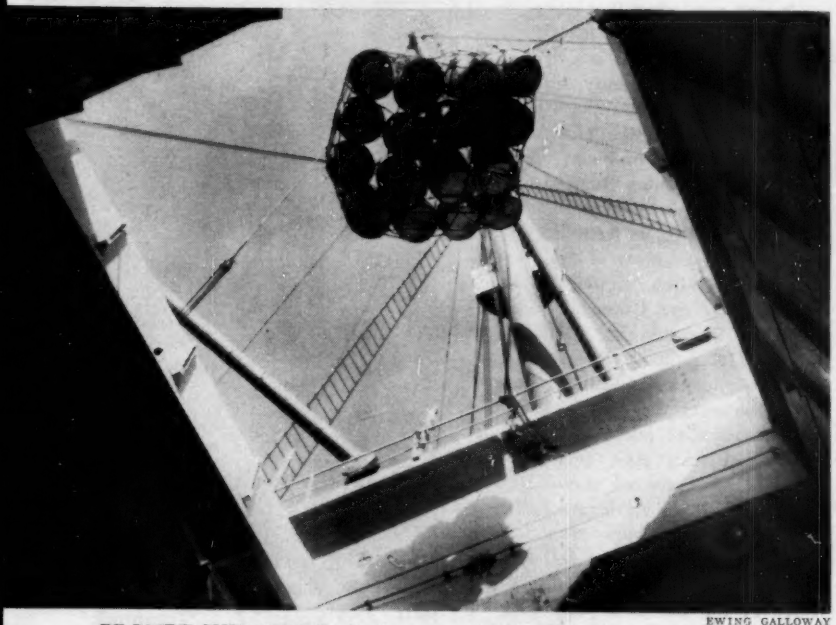

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Lifting Foreign Sales

As workmen scurried about this week building Union Carbide International's new polyethylene plant at Grangemouth, Scotland, division executives were making final adjustments in sales plans for a good, but savagely competitive 1956. Coming up: a greatly expanded, worldwide advertising and marketing campaign.

Specific details aren't yet completely firmed up. And they will, of course, be shrouded in secrecy. (In the past, however, Carbide's promotion has included advertising in local trade publications and U.S. international export magazines, participation in foreign trade exhibitions, direct mail publicity, and the use of Spanish, French and German translations of its English technical literature.)

With this program plus accelerated selling efforts of overseas representatives, the division aims to better its impressive record of the past two years, a record that has boosted sales startlingly each time. What the boosts were, or what current sales figures are, however, Carbide won't say.

Carbide attributes the hefty business chiefly to a philosophy of foreign distribution and sales lessons learned over a period of 30 years of global marketing. The theory: serve foreign customers as you would those at home.

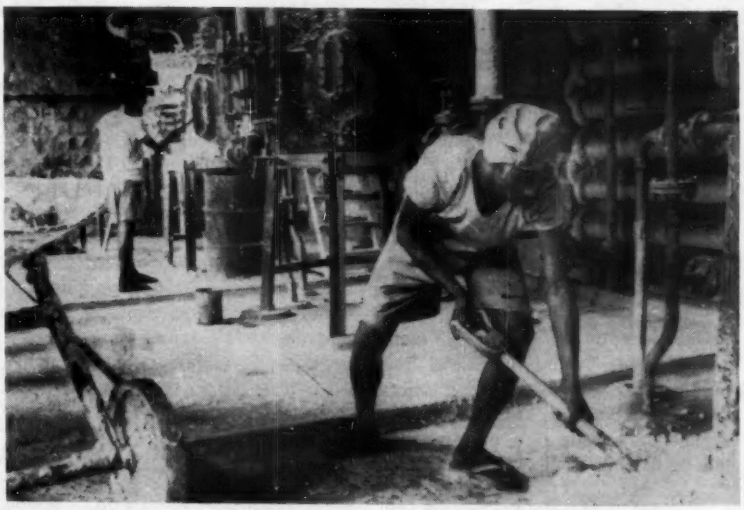
Gone is the time when overseas chemical customers could be treated as outlets for "left-over surplus production" subjected to unreliable deliveries. International distribution must now be on a business-like basis, backed up by a solid partnership with distributors and buyers. Service for the man in Hamburg—sales, delivery and technical—must match that for the purchaser in Duluth.

Like many other American firms, Carbide has established an extensive network of overseas affiliates and foreign distributors. In the International division fold are Union Carbide of Mexico, of Argentina, of Colombia, of England, of India, of Europe, of Brazil, of the Philippines, of Singapore, of Indonesia, of Australia, and of New Zealand. Europa Carbide, headquartered in Geneva, directs European chemical sales; thus covers the most important single area. (South America and Latin America, then Asia rate second and third as profitable territories.)

These companies and a chain of 54 distributors vend Carbide's products. Distributors work through the international companies or New York.

Foreign distributors offer market-wise representation with firm customer contacts. This neatly sidesteps the problem of nonpermanent resident salespeople. Too often, in South America particularly, some companies' sales have been balked by salesmen on a 2- or 3-year stint, who didn't take the effort to make long-lasting contacts.

Most of the business, of course, is done with well-industrialized countries. Solvents, glycols, amines are the



OVERSEAS: Growing Indian industry opens markets for U. S. companies.

principally exported* items, and sell in about the same ratio as sales made domestically.

Carbide pays special care to distributor relations, prides itself on a low jobber turn-over. Local people, usually connected with the jobbers, handle most technical service problems, but "toughies" are referred home. The distributors, of course, aid in providing domestic service standards abroad.

Not Alike: In selling around the world, companies soon discover many a difference from stateside customs. No exception, Carbide International has learned:

- Competition varies directly with the strength of a foreign currency. In Belgium and Switzerland, for instance, where francs stand as strong as dollars, fierce sales contests rage. Too, competition divides about equally between foreign and U.S. concerns.
- Price is relatively a more important sales factor than at home. Reason: a long heritage of haggling.
- Cultivation of service-selling is slow. Although this largely stems from secretiveness and a reluctance to let service people into plants, the emphasis on trading and price also bears some responsibility. Over the years, however, respect and reputation grow, tend to unlatch closed doors.
- Credit risk-taking is surprisingly safe in many European countries. Comprehensive reports are mandatory and sellers can be quite selective. Some Middle East nations, however, remain big gambles. Generally, European firms tend to much more lenient credit-granting policies than do U.S. companies.
- Advertising must generally center on direct mail. More expensive than business paper promotion, it's necessitated by the dearth of well-advanced foreign trade journals.

Generally, European publications are fairly good, but in other corners of the globe quality is lacking. Familiarity of many foreign people with English, however, minimizes this drawback.

One way or another, U.S. companies selling 'round the world find it's profitable to adjust to these differences. And coupled with a policy of home-style service, it's one way of making friends—and sales—abroad.

*The new plant at Grangemouth will be Carbide's first overseas chemical factory, but warehousing and drumming are now done in Belgium.

German View of U. S. Buying: Sound

It isn't very often that management gets an outside view of itself for free. When it does, like as not, it's apt to be unflattering. Recently, however, a group of German purchasing agents spent a month in the U.S. studying our practices and problems, departed with the conviction that American procurement was in the pink of health, well advanced in its techniques.

Under the auspices of the International Cooperation Administration and arranged by the Council for International Progress in Management (USA), Inc., the seven-man group* had two chemical industry members: team leader of the group, Dr. Ernst Falz, director of purchasing for Farbwerke Hoechst AG, and Gerhard Wehling, manager of chemical purchasing at Bayer Aktiengesellschaft.

To get a fresh view of U.S. purchasing, *CW* interviewed Dr. Falz in his Frankfurt offices. Responsible for much of the chemical purchasing of one of Europe's largest chemical companies, Falz had gathered many a distinct impression.

Most pronounced: "The tremendous use of standards and specifications. Nothing outside specifications and standards is bought. American engineers and purchasing agents always comply with them. This is not true in Germany."

Teamwork, Dr. Falz noted, is another star in American purchasing's crown. Said he: "Americans treat things even more methodically than the Germans.

"U.S. firms use a far greater amount of preplanning or implementation through written guide lines. We felt in many cases that American firms were organized on almost military lines as regards lines of communications, responsibilities. In Germany, you find strict discipline in the production end, but a great deal of leeway in the office. In America, while there is a tremendous amount of advance planning on the production side, . . . I didn't see an equal amount of such planning on the purchasing level.

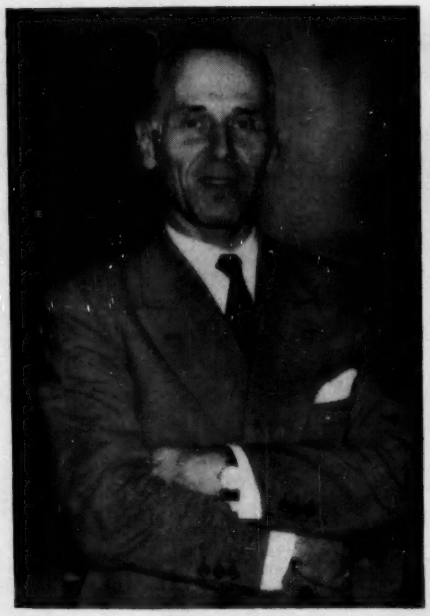
"You organize far more thoroughly, leave little to guesswork. Teamwork is far better . . . is due to a greater degree of self-assurance on the part of Americans. You are a far more classless society.

This makes relations between people easier and more cordial. Coordination of U. S. purchasing departments with others in a plant is far better . . . again . . . based on the American mentality. We hope to follow your lead. . . ."

The cordiality seemed to have its counterpart in the pace of business. Its tempo, said Falz: "More relaxed and calmer . . . no telephone interruptions, for example, which make discussions in Germany such miserable affairs."

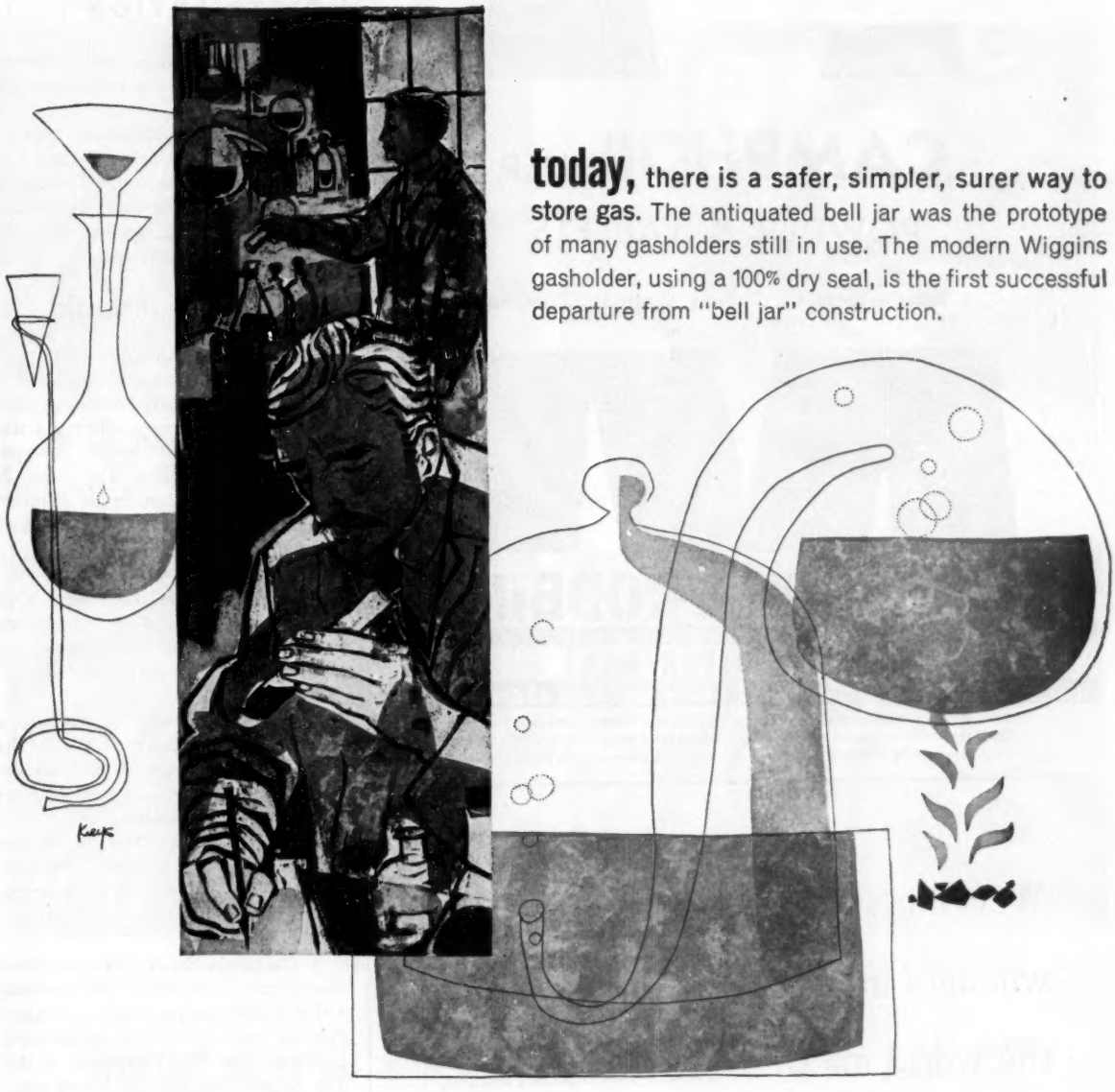
Despite the unhurried appearance of domestic purchasing, Hoescht's buying chief could see no ill effect in relations with suppliers. "The Sherman and Robinson-Patman Acts seem to have considerable influence . . . you have great discipline in supplier contracts. . . . I found no evidence of kickbacks, secret discounts, discriminations."

Well developed though American purchasing is, it still has unresolved problems. Curiously, asserts Falz, the main problem of both U. S. and German buyers appears to be similar: whether to centralize or not. "Your



HOECHST'S FALZ: 'Teamwork, planning, standards'—kudos for U.S.

* The group visited such chemical industry stalwarts as Lederle Laboratories Division of American Cyanamid Co., Union Carbide, J. M. Huber Corp., and General Aniline & Film Corp. Also on the itinerary: Standard Oil Co. of Ohio, Harvard University, Chrysler Corp., and other companies and associations, private and federal.



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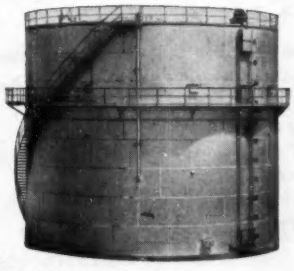

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answer is the same as ours—decentralized purchasing, but centralized control."

Naturally, a penetrating appraisal of a field as vast as purchasing can't be done in a month. Nonetheless, Falz's impressions are comforting, point to a management in shape for tomorrow's rugged buying.

Poly Takes a Tank

Polyethylene tanks are joining the list of large containers available to the chemical industry. American Agile (Bedford, O.) is now offering a new 40-gal. cylindrical vessel equipped with carrying handles. The drum, 26 in. high, with a 22-in. inside diameter, sports a ⅜-in. wall and a ½-in.-thick bottom welded together.

•

Expanding Sales Coverage: Olin Mathieson Chemical is establishing sales offices and warehousing in Omaha for its Western Fertilizer Division.

• Hercules Powder is opening a new office in Albany, N.Y., for its synthetic department. It will service upstate New York and western Vermont and Massachusetts.

• Glidden is switching the foreign distribution of its Southern Chemical division from Atlantic, White Sea, and Baltic Co. to a subsidiary, Glidden International, C. A.

• California Spray Chemical (San Francisco), a subsidiary of Standard Oil of California, has designated Agricultural Ammonia Service as exclusive distributor for Ortho ammonia in the Los Angeles-San Joachim Valley area.

• Chemical & Materials (Terre Haute, Ind.), specialists in railroad and industrial maintenance chemicals, is setting up offices in Chicago.

•

Ready for Reference: Solvents and solvent oils—folder gives specifications, physical constants for range of aromatic petroleum naphthas, solvents, and solvent oils. Pennsylvania Industrial Chemical (Clairton, Pa.).

• Naphthalene — 12-p. booklet (SD-58) gives essential information for the safe handling of naphthalene. Manufacturing Chemists' Assn. (Washington, D.C.).

• Carloading—Check chart offers complete instruction for anchoring loads in freight cars. Signode Steel Strapping (Chicago).

11:00 A.M. EST: Merchants' New York office receives local phone call from troubled purchasing agent. Can you help us? Our Chicago plant needs 5 drums trichlorethylene *immediately*.

11:06 A.M. EST: Message goes out by teletype to Merchants' Chicago office, where rush order and delivery instructions are relayed to adjoining warehouse.

10:20 A.M. CST: Five drums of trichlorethylene are loaded on small delivery truck.

10:45 A.M. CST: Shipment arrives at customer's plant, less than an hour after initial call.

Ordered at 11:00 A.M. EST; Delivered at 10:45 A.M. CST

MERCHANTS CHEMICAL BEATS THE CLOCK!

For thirty-five years Merchants Chemical has made a habit of special service and prompt service in the distribution of industrial chemicals. The list of products includes acids, alkalis, fungicides, surfactants, chlorinated solvents, emulsifiers, laundry compounds, soaps, dry ice and chemical specialties.

In the instance outlined here, Merchants actually beat the clock in an effort to get material to a customer when and where he needed it. Close cooperation and an efficient communication system among the nationwide Merchants' offices made it possible. Wherever you locate, Merchants can serve you.

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Australian workmen install feed system in effort to exploit Lurgi process as . . .

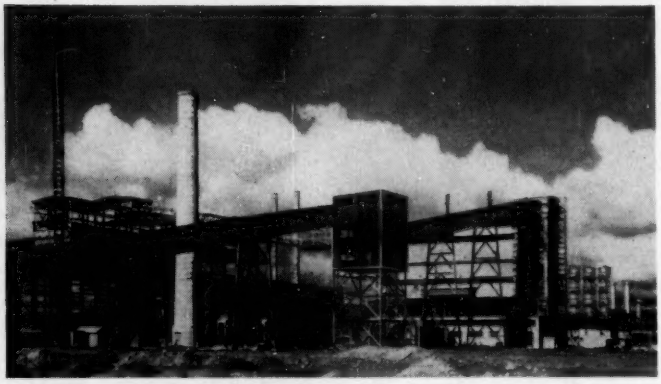
Lignite's New Lease on Life

DEEP in the heart of Texas natural gas country, Alcoa is causing a minor sensation by its effort to use lignite as a source of power and chemicals. Some time ago, M. W. Kellogg nailed the imagination of chemical engineers through its South African project to obtain synthesis gas (for gasoline) by gasifying lignite. Now there's a third attempt to elevate the status of lignite as a chemical raw material:

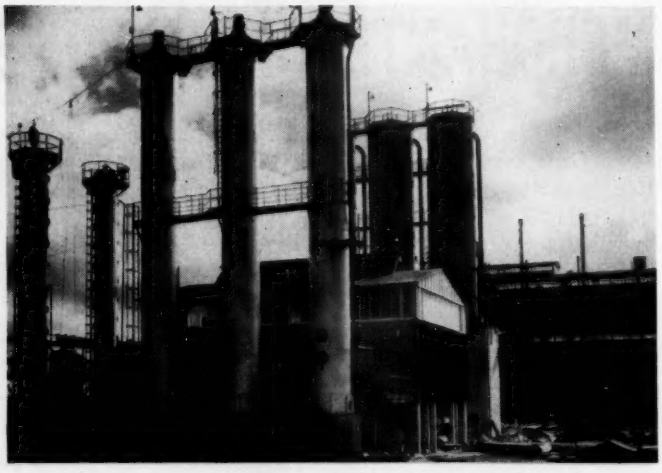
In Australia's fertile Latrobe Valley, the State Gas & Electric Corp. is setting the stage for the country's first large-scale effort to utilize its abundant lignite deposits. To cost $22.5 million, the plant is expected to be completed in September, place initial emphasis on the production of town gas (principally methane). Eventually, however, liquid fuels and chemicals are expected to pour out in quantity.

The plant will provide about 18 million cu. ft./day—more than a third of Melbourne's gas consumption. And by 1976, it's expected to be yielding annually: 20 billion cu. ft. of town gas, 20 million gal. of gasoline, 22 million gal. of diesel and fuel oil, 13 million gal. of brown coal tar, 5 million gal. of high-octane motor fuel, and 1.5 million gal. of solvents.

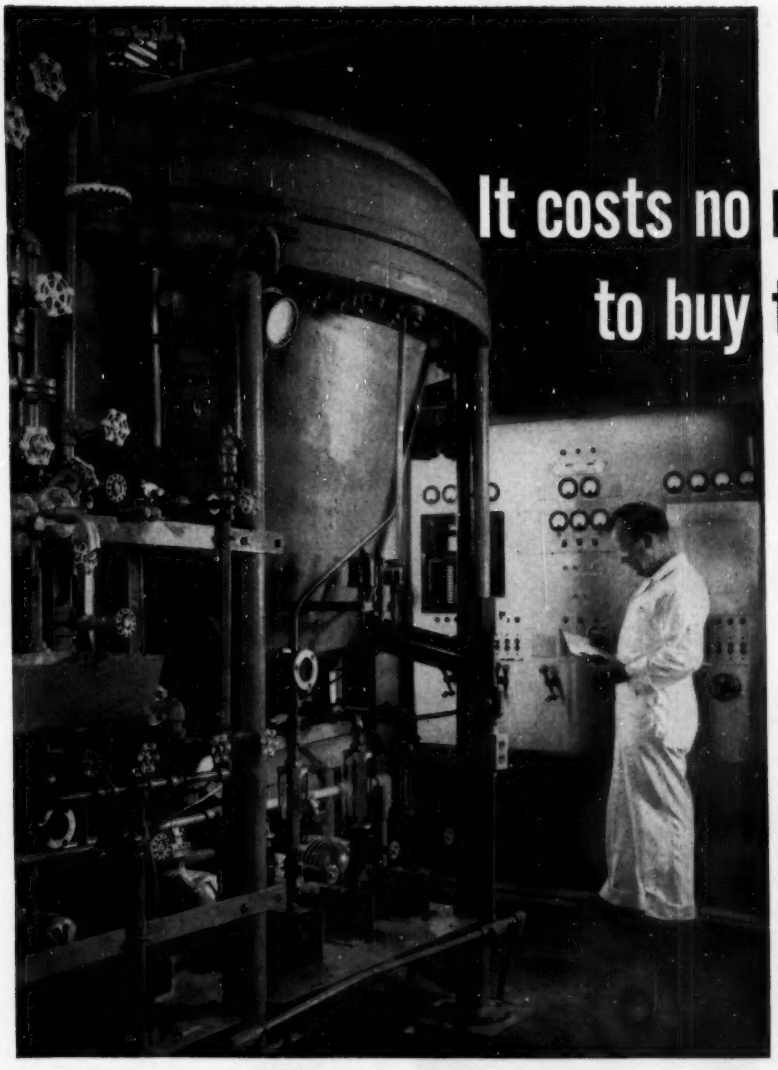
Prompted by Shortage: Because of an impending shortage of black coal, Australian scientists started looking at means of tapping lignite. They decided on the Lurgi approach, ex-



LIGNITE ENTERS gasification plant via belt conveyors . . .



. . . exits as gas and chemicals from purification system.



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Eastman's molecular distillation purifying process produces premium quality dioctyl phthalate at a "regular" price

Today, trade reports indicate that no other commercially available DOP excels Eastman DOP in the all-important combination of low odor, low color, low acidity, high stability and high ester content.

This quality superiority is attained by the extra purification step that every drop of Eastman DOP undergoes. That extra step is molecular distillation—a process perfected by Eastman.

Utilizing banks of molecular stills similar to those used in the manufacture of high-purity drugs and vitamins, Eastman removes the degrading impurities responsible for color and odor much more thoroughly than is possible by ordinary purification methods.

Eastman DOP is specified to have a maximum color of 25 APHA and to be essentially odorless at room temperature.

Choose Eastman DOP as the plasticizer when your products must meet the highest standards. It costs no more for the extra protection it brings. Send for a sample. Evaluate it in your own plant. We are confident you will agree with our customers that Eastman DOP is the finest DOP that can be bought.

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CHEMICAL PRODUCTS, INC.
KINGSPORT, TENNESSEE
Subsidiary of EASTMAN KODAK COMPANY

SALES OFFICES: Eastman Chemical Products, Inc., Kingsport, Tennessee; New York City; Chicago; Framingham, Mass.; Cincinnati; Cleveland; St. Louis; Houston; **West Coast: Wilson Meyer Co.,** San Francisco; Los Angeles; Portland; Salt Lake City; Seattle.

amined the process before existing German plants* were shrouded by the Iron Curtain, and arranged to import the necessary equipment and know-how.

Developed by Dr. Dorschner of Lurgi Gesellschaft, the process gasifies lignite or other noncoking coal. The generator is essentially a water gas producer. In Australia, the lignite will serve as both fuel and raw material.

Some of the lignite will be burned to provide steam (which will be superheated to 977 F by firing waste gases from the generator). The rest will be partly dried, briquetted and fed to the Lurgi generator. There it will react at 450 psi. with steam and oxygen from an adjoining air separation plant.

In the lowest portion of the fuel bed, a secondary reaction—hydrogenation—causes hydrogen to react with carbon to form methane. Higher in the fuel bed, the descending briquettes are subjected to distillation, which enriches the product stream with other light hydrocarbons.

Gas Recovery: To strip impurities and by-products from the pressurized gas, it's first scrubbed and cooled by water sprays and a series of tubular heat exchangers. Next, it passes through a bubble-cap tower in which benzene is extracted by scrubbing with recirculated oil. As another example of its self-sufficiency, the process uses oil that's made from by-product condensates. The last step is the removal of carbon dioxide and hydrogen sulfide, both of which are readily soluble in recirculated water under the system's high pressure.

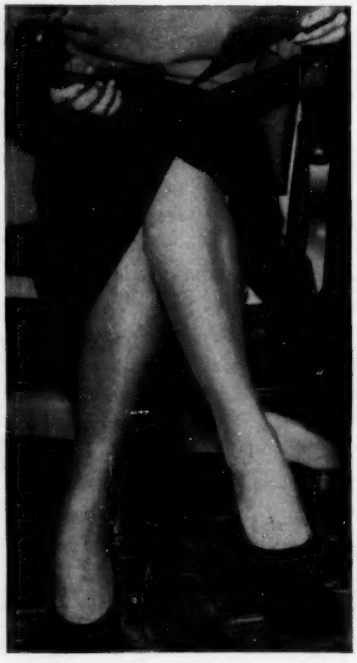
No Competition: Here in the U.S., lignite hasn't been able to compete with black coal, which is plentiful and economical to use. For one thing, brown coal contains a lot of water (about ⅔ by weight); and for another, the low-temperature tar it yields contains no naphthalene and few marketable tar acids.

Though Australia is counting heavily on efficient utilization of its 20-billion-ton lignite cache, lignite remains an economic riddle in many other parts of the world. And since the Lurgi gasification process is specifically designed for noncoking fuels (doesn't work with black coal), its success stands or falls with lignite.

*The first Lurgi plant was built in Germany in 1936 at Hirschefelde. Others were built in Bohlen (1940) and Brux (1943).

PHONING for weather news and safety tips, Carbide men run into this . . .

Mystery: Who's Behind the Voice?



Dial 682, and if a woman answers, don't hang up. She will be the Mystery Gal who dispenses the safety message of the day to employees of Carbide and Carbon Chemicals' Texas City plant.

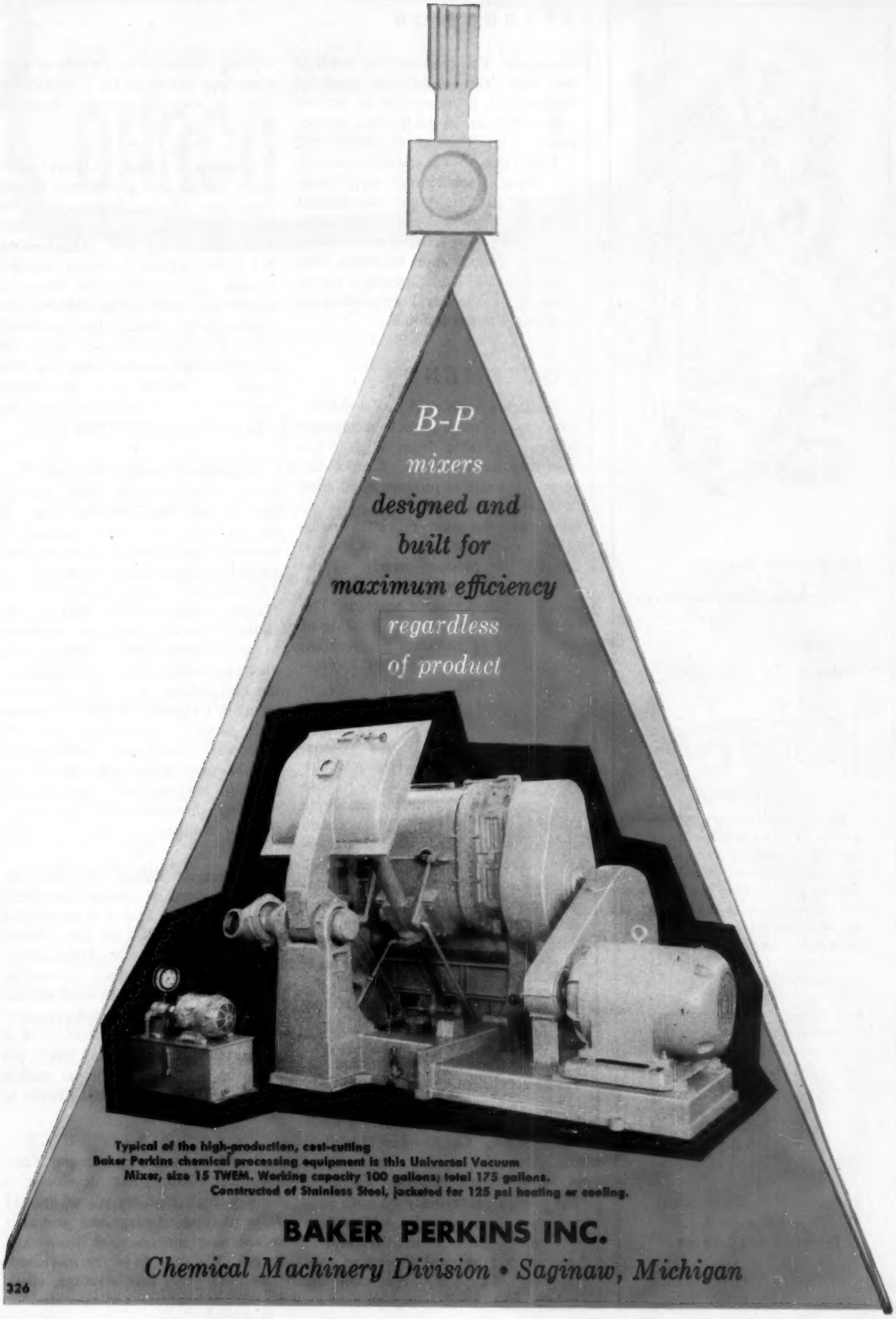
The Mystery Gal's safety campaign is only the latest of several novel telephone services that Carbide inaugurated last year as part of its hurricane preparedness plan (*CW, July 9, '55, p. 84*). By now, her sultry voice is well known to Texas City Carbiders, but her identity is a well-kept secret.

It all started when the plant's insurance and benefits division found itself swamped with calls every time a hurricane was reported in the Gulf area. To keep employees informed of local weather conditions, the company installed two tape-recording telephones that automatically recited up-to-the-minute bulletins. By the time the hurricane season was over, the service was so popular that the taped news- and weather-casts were put on a permanent basis.

Workers now use the service to keep up to date on the safety program, key personnel changes, and important in-plant events. And many rely on the semiweekly long-term weather forecasts when planning weekend outings or fishing trips.

On Safe Driving Day, callers dialing 682 heard a short skit, tape-recorded "on location" by plant safety

B-P
mixers
designed and
built for
maximum efficiency
regardless
of product



Typical of the high-production, cost-cutting Baker Perkins chemical processing equipment is this Universal Vacuum Mixer, size 15 TWEM. Working capacity 100 gallons; total 175 gallons. Constructed of Stainless Steel, jacketed for 125 psi heating or cooling.

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DPi

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inspectors. The spine-chilling crash at the finish lent an ominous touch of realism that is impossible to achieve with conventional poster-type promotion.

Ever since Miss X started answering the phone, Carbide men have really kept the circuits busy; the normal daily rate of 300-400 calls triples when the Mystery Gal is on duty—a situation that doesn't upset insurance division managers. They find that it's good business to help her keep production men dangling on her line.

EQUIPMENT . . . .

Radiation Source: A new 3-million-volt Van de Graaff particle accelerator is now available from High Voltage Engineering Corp. (Cambridge, Mass.). It's said to produce a radiation field several hundred times more intense than the most powerful industrial radioactive cobalt source, is designed to produce nearly all the fundamental radiations — electrons, X rays, positive ions, or neutrons. The machine has a power-output rating of 3,000 watts of radiation at 3 million volts, is suited to numerous applications (*CW, Dec. 3, '55, p. 58*) in chemical and pharmaceutical processes.

•

Purge-Type Couple: Trinity Equipment Corp. (Roselle Park, N.J.) has developed a purge-type thermocouple assembly for use on high pressure reactors, catalyst beds, etc., that operate at temperatures as high as 2900 F. The unit consists of a silica-free ceramic tube that houses a platinum purge tube and a platinum, platinum-rhodium couple. Assembly is mounted in a ball-type socket for easy alignment with vessel wall, is vented through the mounting flange to protect ceramic tube against pressure surges.

•

Motor Control: Fully automatic remote control of electric motors in a variety of production applications is the goal of Rietz Manufacturing Co.'s (Santa Rosa, Calif.) new Loadtrol unit. Activated by either an overload or an underload current signal, it responds instantaneously on both stop and start functions. In addition to eliminating hazards to the motor, Loadtrol can be used to ensure continuous full-capacity operation of feeders and similar equipment by limiting operation to periods of optimum load. It's made for 5- to 150-hp., 220- or 440-volt motors, is priced under $200.

•

Diaphragm Valve: To provide leakproof control and unrestricted flow of acids, oils, alkalis, slurries, and most other hard-to-handle liquids, Stockdale Engineering Co. (Haddonfield, N.J.) now offers a Wynn straight-through diaphragm valve. Made of rubber or other flexible materials, the diaphragm is molded in the "as closed" position to reduce strain when the valve is closed. Bodies come in a wide range of metallic and nonmetallic materials, in ½- to 14-in. sizes, for use at pressures to 250 psi.

•

Magnetic Control: Nuclear Magnetics Corp. (Boston, Mass., subsidiary of The Perkin-Elmer Corp.) is out with a new system designed to provide accurate stabilization and control of magnetic fields in the 300- to 18,750-gauss range. Known as the Numar Model C-1, it utilizes principles of nuclear magnetic resonance to derive error signals directly from the field, rather than from magnetizing coil voltage or current measurements. It's expected to find application with particle accelerators, and with microwave and mass spectrometers; can be used to control two of the latter in tandem, thus approximately squaring the resolving power of a single instrument.

•

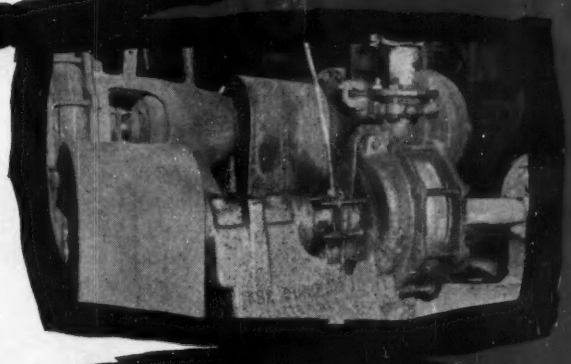
Diaphragm Pump: A new all-purpose chemical pump — OKM Model 100-C — is now in production at O. K. Machine & Tool, Inc., (Waco, Tex.). Featuring solid Teflon pump head, valve components, connecting flanges, and nipples, it's said to successfully handle all acids, alkaline solutions and petroleum hydrocarbons at temperatures from —50 to 300 F. It's made in 1-, 2- and 3-cylinder models for capacities to 300 gph. at heads to 40 ft.

•

Barrel Opener: Puget Sound Tools (Seattle, Wash.) has developed a bung wrench that fits all of the 15 different types of plugs and vent caps in common use on steel drums and barrels. The snug fit of the machined-steel head gives sure leverage, eliminates danger of cracked knuckles.

For "economy, long life, and freedom from contamination,"

DURCO is the choice at



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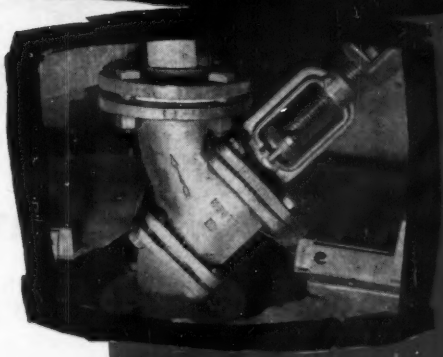
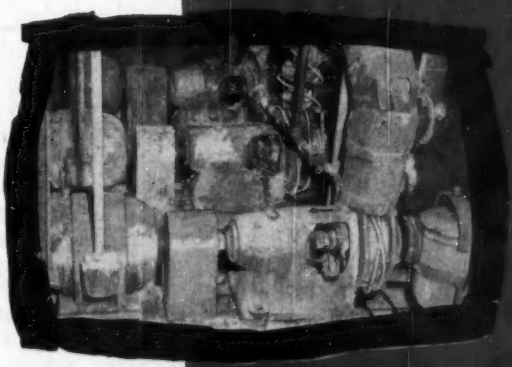
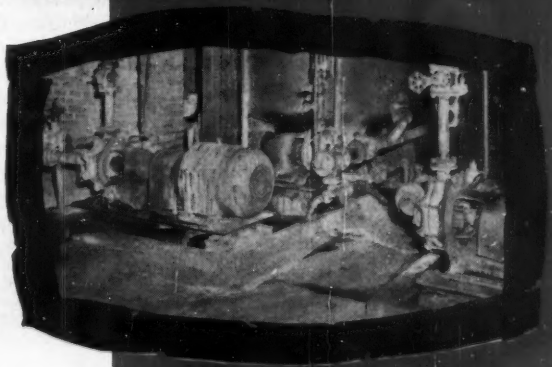
Durcopumps and Durco valves were selected for:



- ... transferring slurries of acid and direct dyes ...
- ... sulfonation of organic compounds with 25% Oleum ...
- ... concentrated solution of mixed sodium and potassium hydroxides at temperatures in excess of 100° C. ...
- ... handling a solution of benzoyl, benzoic acid in benzine saturated with aluminum chloride solution ...
- ... transferring alkaline solutions and saturated aluminum chloride in water solutions.



For detailed information about these Durcopumps, Durco valves, and other DURCO corrosion resisting products, contact your DURCO representative or write.



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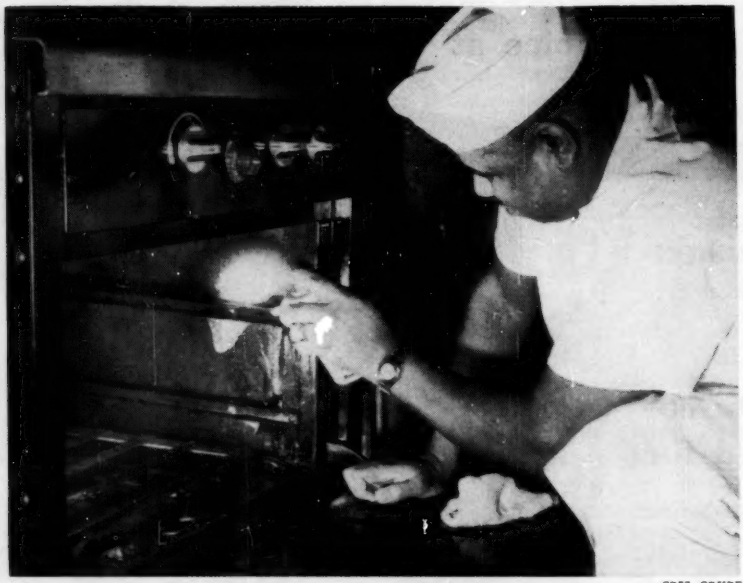

CRIS GRUBE

STOVE CLEANUP: Aerosol oven cleaners touch off a new kind of range war.

For the Cook's Convenience

Selling at a 4-million-units/year clip, aerosol-type oven cleaners bring new competition to this $10-million/year specialty business.

Claiming safety, simplicity and speed of operation, the push-button devices are whittling the lead of long-dominant caustic-base paste products.

But the aerosols aren't unchallenged: a new, lye-free paste cleaner, now being introduced, is claimed to be far more effective than aerosols, safer to use.

It was just about five years ago that chemical specialties makers first eased open the door of the family stove and peeped at the tempting market for oven cleaners. In that five-year span, oven cleaners, largely sodium hydroxide-base products, have climbed to the $10-million/year sales bracket. And right now, thanks to the advent of aerosols, the business is undergoing the most strenuous change since its start.

• Six months ago, aerosol-packed, noncaustic oven cleaners burst on the housewares market. Already, over 2 million cans of Hep, Bostwick Laboratories' (Bridgeport, Conn.) pioneer item have been sold. Sen Spray (Daycon Products Co., Washington, D. C.) and Spee-Dee Oven Cleaner (Demert & Dougherty, Chicago) are hot on its tail, and new products are being launched weekly*.

• This week, G. N. Coughlin Co. (Orange, N. J.) is shipping the first of an entirely new kind of its Easy Aid cleaner. A paste-type product, it is said to match the effectiveness of the caustic cleaners, yet be far less hazardous to use—safer, Coughlin claims, than the aerosols, which are strongly plugging the safety theme.

Safety Code: The aerosol safety pitch has stirred up considerable controversy, in itself. Eager to avoid the trouble that besieged makers of aerosol hair laquers (which were declared fire hazards, and banned in some cities), packagers have called on Foster D. Snell, Inc., for evidence to back their claims. Essence of Snell's report†: "The solvent type of formulation we have tested is safe for use, provided the manufacturer's directions are followed."

Effectiveness Question: Even if that satisfies municipal officials about the products, it likely won't satisfy makers of caustic cleaners, who say label instructions don't make the product any safer. But even without the safety question, there's plenty of controversy surrounding the new products. Simply, makers of the paste-type cleaners say the pressure-packed compounds won't remove burnt-on foods—won't do the job they're touted for. As evidence, they cite directions on Bostwick's Hep, which has a paper instruction-collar suggesting use of ammonia and steel wool to clean off hard-to-remove food spills.

Makers of the aerosols, on the other hand, argue that they don't claim to have a miracle product, point to repeat sales as proof of consumer satisfaction (estimates are that 3-5 cans/year are used per customer). Their basic point: the aerosols make fast, simple, regular cleaning possible —if an oven is maintained with their products, steel wool and caustic chemicals won't be needed.

Inside Story: While in-store purchases are determining how the consumer regards the efficiency of the aerosols, there is no denying that they are an important step in oven-cleaner development. Originally, the housewife scrubbed her oven with whatever soap or scouring powder she favored; used steel wool and elbow grease on the worst areas. Synthetic detergents, to cut grease, and solvent cleaners eased the job some, but the biggest formulation step came with the development of caustic-base cleaners.

First important product of this type

*A-M-R Chemical Co. (Brooklyn) and Zoe Chemical Co. (Queens Village, N. Y.) have two of the latest.

†F. D. Snell told *CW* last week: "The oven cleaners fall into the class of household chemical products where an effective formulation may present some possible hazard to the consumer or his property, unless appropriate directions for use are established and adhered to. It is frequently necessary to test the complete formulation under exaggerated service conditions, in order to establish whether a hazard exists. If needed, suitable directions and precautions must then be drafted. Seldom can this be determined from formulation alone, without test. The solvent type of formulation we have tested is safe for use, provided the manufacturer's directions are followed."

Report.....on CHEMICO

Sludge Acid Regeneration Plants

CONSOLIDATED CHEMICAL INDUSTRIES

Division of Stauffer Chemical Company
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HOUSTON 2, TEXAS

December 7, 1955

AIR MAIL

Mr. J. H. Ruskin
Executive Vice President
Chemical Construction Corporation
525 West 43rd Street
New York 36, New York

Dear Mr. Ruskin:

I want to tell you that we are very much pleased with the manner in which our Baytown and Houston, Texas, Sulfuric Acid Regeneration Plants are performing.

We think that your organization applied itself most diligently and efficiently to the design and construction of these two plants.

We mean sincerely the things we are stating in this letter and we trust that you and your organization will continue to prosper and we look forward to having you do engineering and construction work for us in the future.

Very truly yours,

E. S. Rothrock

Vice President

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design and construction

future work by Chemico

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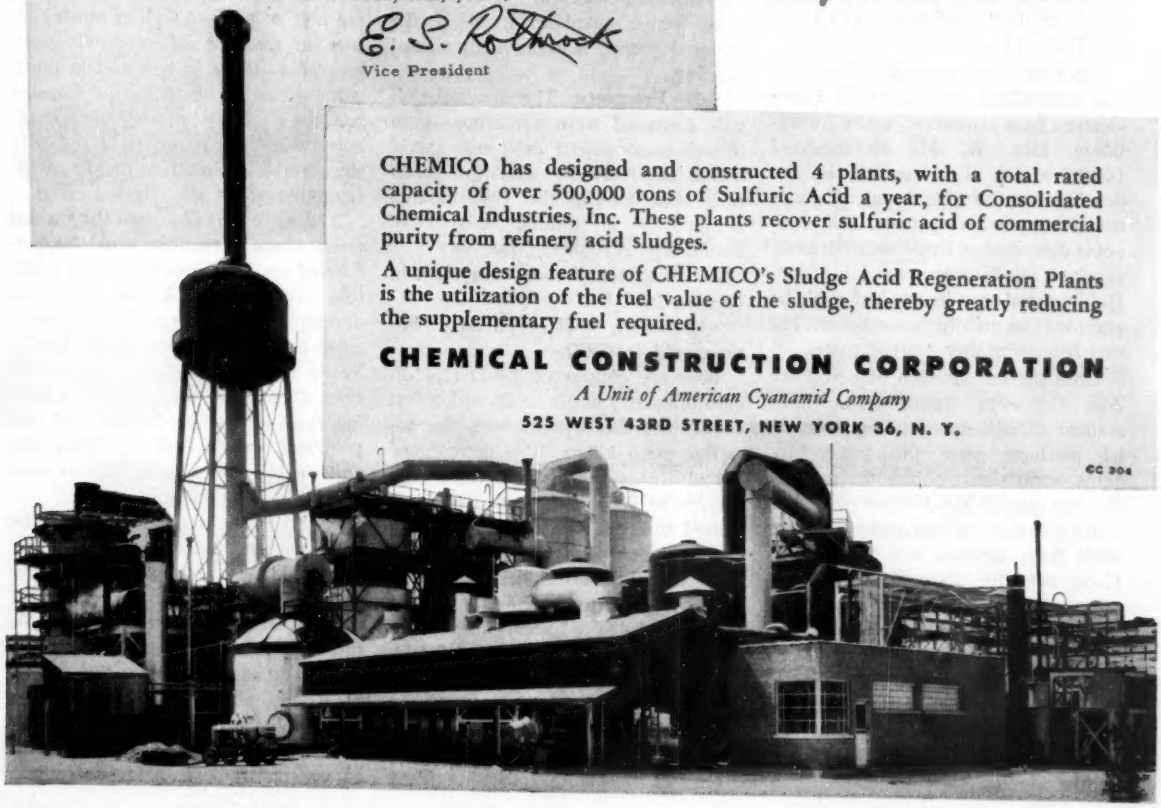


was Easy Off, made by Wolcott Co. (Hartford, Conn.) and later bought by Boyle-Midway. Containing about 9% sodium hydroxide, plus carboxymethyl cellulose, in a water-base paste or jel, the compound worked very effectively, and (since lye content was under 10%) avoided the skull-and-crossbones precautionary label.

Easy Off remains the number one seller in the nation (sales are estimated to be at least $3 million/year), though it has since been joined by G. N. Coughlin's Easy Aid (which is being changed in formula), Merritt, Inc.'s (New Rochelle, N. Y.) De-Grease-It, and Kern & Currie Mfg. Co.'s (Tucson, Ariz.) 1*2*3*, to list a few.

The new aerosol formulations are described variously as a mixture of solvents and surface-active agents, or of solvents and "cleaning additives" plus thickening agents (to prevent excessive rundown). Makers of the paste cleaners say their analyses of some of the aerosols show a formula very close to one suggested by Du Pont as a paint remover: crude scale wax (2% by weight); ethyl cellulose (2%); methylene chloride (39%); methanol (9.1%); Cellosolve acetate (9.6%); trichlorethylene (13.3%); and Freon 12 propellent.

No Lye: Now, spurred by the safe-use campaigns, producers of paste cleaners have uncovered a new formulation idea. R. M. Hollingshead (Camden, N. J.) has led in the development of this type of product, has applied for patents. The product is described as based on an organic (amine) salt that does the job of lye. Hollingshead says its product can't be regarded as totally hazard-free, but that it is safer than caustic pastes.

Until the introduction of new Easy Aid, the oven cleaner battle lines seemed clearly drawn. The paste or jel products were the heavy-duty items, somewhat troublesome to handle, but possessing a clear price advantage (16-oz. sell for under a dollar, while 6-oz. aerosols sell for 89-98¢, 12-oz. cans for about $1.50). Aerosolers claimed greater safety, faster action, and far greater convenience.

Now, if Coughlin's claims stand up, the safety angle has lost its value for the aerosol advocates. Just how that will swing cleanser sales should become plain within the next few months.

Old Enemy —aquatic weeds

New Weapons —new herbicides; new combinations of herbicides

These shared the limelight at the Weed Society of America's first meeting, as the nation's agricultural scientists launch . . .

New War on Weeds

New slants and familiar characters were in evidence at last week's New York meetings of the newly formed Weed Society of America and the Northeastern Weed Control Conference: the same familiar weeds, but they're in for renewed attack; many of the same chemicals, but they're accompanied by promising new developments; the same agricultural scientists, but they've got a brand-new organization.

The new group, the Weed Society, is national in scope, covers various phases of weed science; the meeting was its charter get-together. The Northeastern Weed Control Conference, which acted as host for the national group, held its 10th annual meeting.

Safe Prospects: The new chemicals discussed were numerous—even though many papers dealt with established commercially available materials—and among the best looking compounds in limited tests (*CW Technology Newsletter, Jan. 14*).

- 2,4-dichlorophenoxy butyric acid (tagged 2,4-DB).
- 2-methyl, 4-chlorophenoxy butyric acid (MCPB).

Both are cousins of 2,4-D (2,4 dichlorophenoxy acetic acid), which first acquainted the layman with the selective weed killers. The newcomers' big advantage appears to be their high toxicity to broadleaf weeds, with low hazard to crops like corn and alfalfa and clover. A particularly hopeful aspect: the phenoxybutyrics are not as damaging to cotton as 2,4-D, might be used on fields adjacent to cotton, where drift formerly ruled out 2,4-D.

Both products are due for much more testing, but they're available in experimental quantities from American Chemical Paint Co. and Dow.

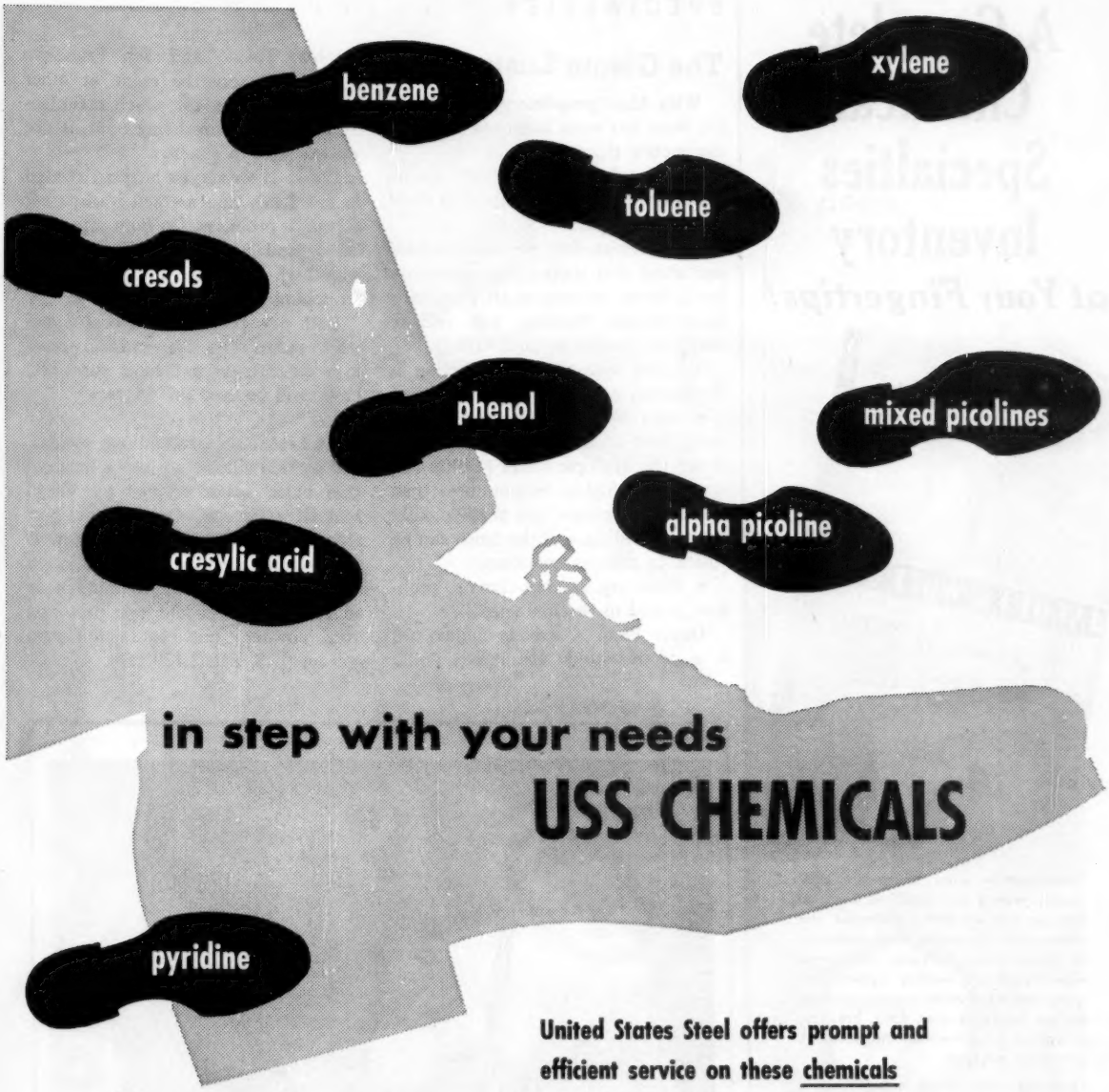
One of the more intriguing ideas tossed out at the meeting concerned the use of combinations of herbicides. As yet, little work has been done on combination products; yet there's no doubt that the prospect of broad effectiveness and single application, with attendant reduced cost, appeals to both truck gardener and the farmer.

International Kickoff: In its charter meeting, the national Weed Society took an international flavor, with weed experts from all parts of the U.S. and from Canada and England describing weed problems and solutions in their areas.

Center of plenty of attention at the meeting were aquatic weeds, which are now recognized with as much concern as that for other specific weed problems—those in turf and in horticultural and agronomic crops. Causing particular trouble in irrigation channels, water weeds are hard to quell, since herbicides used on them can unfavorably affect all irrigated crops.

And while they discussed the various areas where herbicides could be useful and marketed profitably, the scientists didn't overlook the fact that developing and testing the new herbicides can be an expensive thing. Du Pont's M. T. Goebel provided a succinct illustration: the cost (not including facilities for production and distribution) to his firm of discovering and developing urea herbicides now totals over $3 million.

As hosts to the national group, the Northeastern Weed Control Conference held its meeting the day after that of the new society. And like the society, NWCC devoted considerable time to aquatic weeds, and to another somewhat neglected area, the control of woody plants. In addition, there were preliminary reports on a crop of new chemicals that may be joining the commercial ranks in a few seasons.



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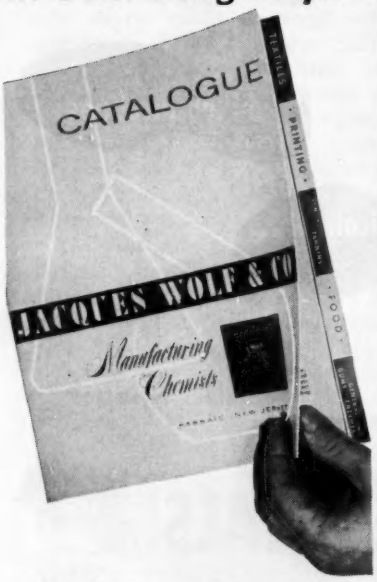

Throughout the pages of the new, completely revised and simplified Chemical Catalog you will find a distinctive and definite line of Jacques Wolf auxiliaries in condensation—enzymes, detergents, water-repellents, wetting agents, oils, gums, and many other specific chemicals for the textile, leather, food, brewery, lithographic, pharmaceutical, cosmetic and allied industries.

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The Gleam Lasts

With high proprietary enthusiasm, Du Pont last week launched two new automobile paints.

Trademarked Lucite and Dulux 100, the new paints are stated to share these advantages:

- The finish they possess is so hard and shiny that waxing is unnecessary for at least 18 months after painting (conventional washing will remove road film, restore original luster).
- Color change by weathering is minimized.
- Marring and scratching are resisted, both on the production line and in service. Multiple bakes (Dulux 100 is cured at higher temperatures than conventional paints) are possible without color fading, and the finish can be buffed to remove scratches.
- Blistering, a wet-climate problem, is said to be eliminated.

Dulux First: Currently Dulux 100 is in production at Du Pont's Philadelphia, Toledo and San Francisco plants, will soon be made at other locations. Lucite, for which manufacturing facilities are being built, is not yet available in quantity.

Lucite is an acrylic lacquer, related to the firm's trademarked transparent plastic. It promises, Du Pont says, new colors and new color effects, along with high resistance to staining and scratching.

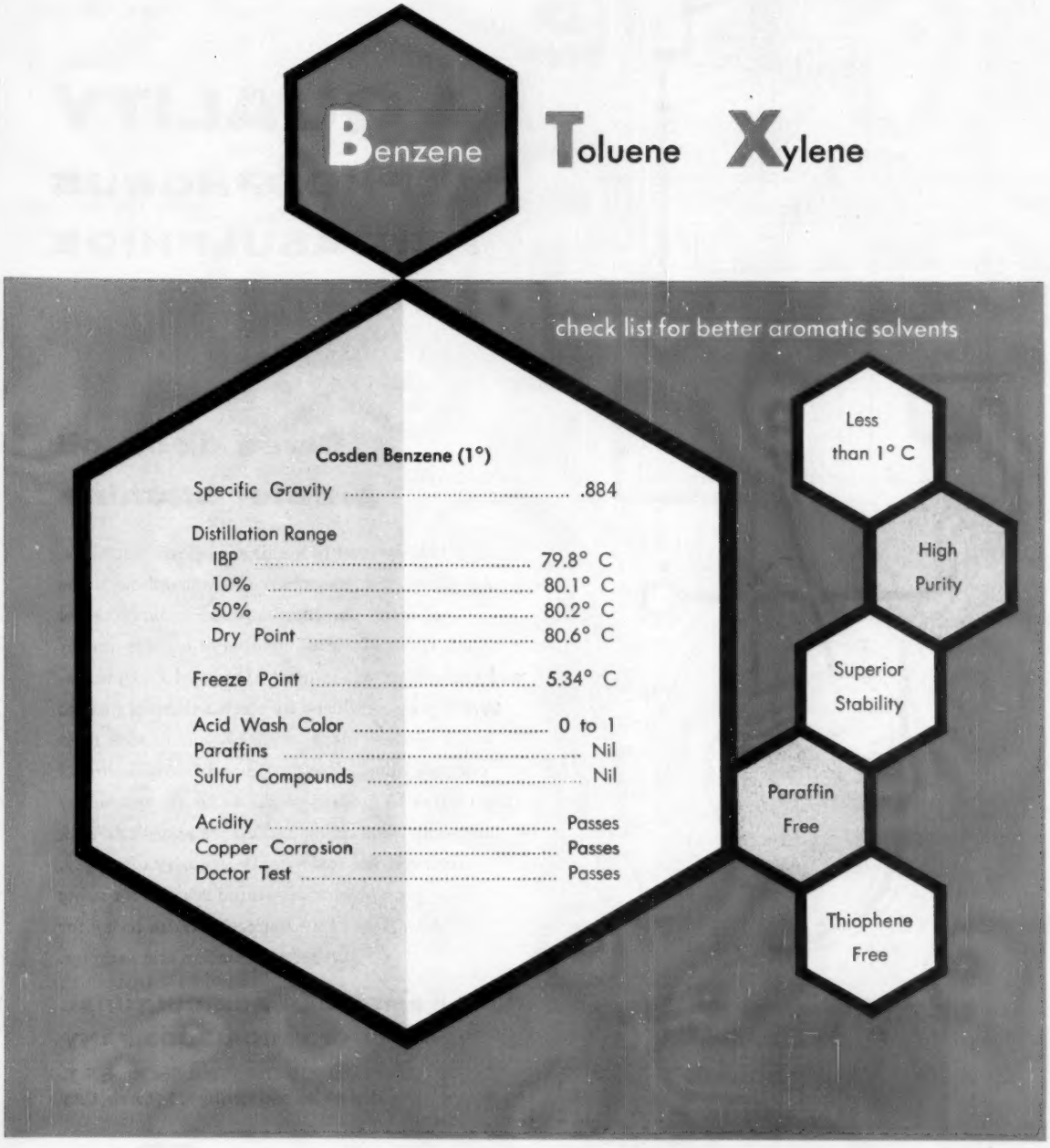
Both new paints, which cost somewhat more than conventional coatings on straight gallonage (not use) basis, will be used on '56 cars.

•

No Leaks: Sugar, aluminum powder, and sodium silicate go into a new engine block sealer created by Vergil Metcalf (Glencoe, Okla.). One part aluminum is combined with two parts sugar; water is added and the solution boiled. To the sticky aluminium is added 17 parts silicate, one part cast iron powder, one part aluminum powder (U.S. Pat. 2,729,568).

Brighter Future for 'All'

JAY HARRIS, director of Application and Research at Monsanto, isn't resting on his laurels (he received an award, last month, from the Chemical Specialties Manufacturers' Assn. for his work in synthetic detergent development). Continuing his research, he recently headed a syndet research team that came up with a brand-new optical whitener for All, Monsanto's low-sudsing detergent. All, with its new whitener, was introduced to the trade last week.



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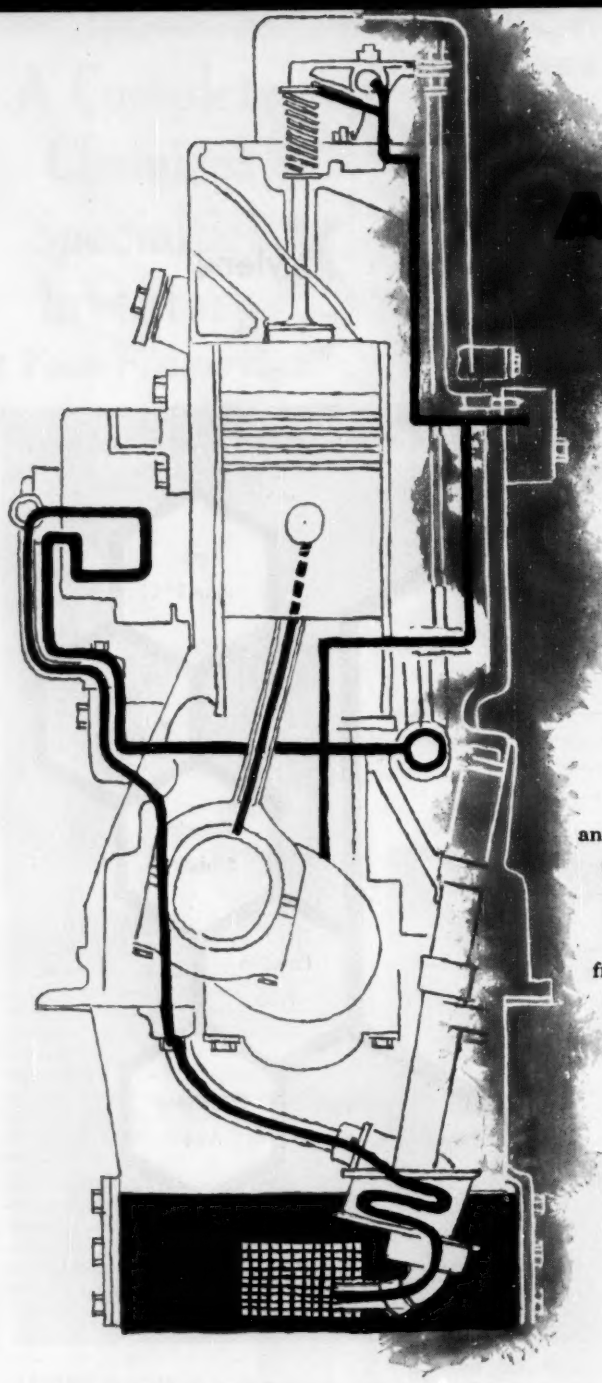

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Market Newsletter

CHEMICAL WEEK
January 21, 1956

A general tidying of price schedules seems to be in order following the rush of new-year price adjustments.

Case in point is Monsanto's move to standardize at $1 the hundredweight differential between bulk and less-than-carload prices of several sodium phosphates.

New l.c.l., cwt. prices include: sodium tripolyphosphate, $8.875; tetrasodium pyrophosphate, $8.525; crystalline trisodium phosphate, $5.40; monosodium phosphate, $9.70.

Cellophane for export was left untouched when domestic prices were advanced in mid-October (*CW Market Newsletter, Oct. 22, '55*), but Du Pont's just announced increases (about 5%) on foreign-bound materials restore the line-up.

Postponement of the effective date of price increases on some Sherwin-Williams organic colors is said to stem from a competitor's hesitance to follow suit (*CW Market Newsletter, Dec. 3, '55*).

The deferment—of indefinite duration—affects all forms of Alkali Blues, prices of which now revert to those currently in effect.

Also, previously announced 10¢ increases on Permansa Reds and Dearborn Reds are cut back by 5¢/lb. to match competitive tags.

New prices, effective Jan. 1: Permansa Reds, $1.25/lb.; Dearborn Reds, $1.30/lb.

•

Further diversified markets for dimethyl silicone fluids and emulsions are the hoped-for benefits of a sizable price reduction.

The 7.5% cut by Dow Corning—sparked by the completion of a capacity-doubling expansion of its methyl siloxane unit—reduces Dow Corning 200 Fluid to $3.14/lb., and Mold Release Emulsions to 1.26/lb.

•

Epoxy resin makers will welcome a new commercial-quantity source of bisphenol A, an intermediate in the manufacture of epoxies.

This latest addition to Monsanto's fast-growing line of resin intermediates follows adipic and fumaric acids (introduced in the past year).

Something to watch for: dibutyl fumarate and dibutyl maleate—both in advanced stages of development.

•

One producer's curtailment of soybean operations this month echoes last winter's rash of plant closings that ranged from 3 days to 2 weeks. (*CW Market Newsletter, Feb. 26, '55*).

Heralding a probable repeat performance is A. E. Staley's 15% operational cutback this month. Reason: overproduction.

Demand for soybean products in the last quarter of '55 was higher than in the same period of '54, but still well below the record processing rate.

•

New deposits of phosphate rock, discovered near Bear Lake, Idaho, will add long-term reserves to West Coast fertilizer operations.

To be developed by Stauffer Chemical, the deposits are estimated to contain over 5 million tons of commercial-grade rock; but this amount may be doubled or tripled if beneficiation of lower-grade secondary beds prove feasible.

Looking for phosphorus is a current project of the U.S. Army's Procurement Division. Opening date for bids (Bid No. CML-30-070-56-29) on 350,000 lbs. of white phosphorus is Feb. 6.

Riding along with this bid is another (No. CML-30-070-56-30) for 93,020 lbs. of Thickener Incendiary Oil M2 (Spec. MIL-T-13025A) in metal drums, 20 lbs. net contents. Opening date for this item is Feb. 8.

•

Confirmation of the plaint that lead prices are too high comes in the form of a ½¢/lb. cut. But the new price—16¢/lb.—is still regarded as too high, compared with levels of the past year or so.

Attributed to the easing of lead prices—and good news to paint-makers—are lower tags on several lead oxides; e.g., ½¢/lb. cuts on dry red lead, litharge, and orange mineral. New schedules: 95% dry red lead in carload quantities, 18.5¢/lb.; litharge, 17.5¢; orange mineral, 21.6¢.

Speaking of paint, 1955 was a record-breaker for the industry. According to figures just released by the Bureau of the Census, sales of paint, varnish and lacquer products during the first 11 months were 11.7% above the same period of '54, and topped, by almost 1%, the annual record set in '53.

Industrial sales recorded the highest gains—a full 18.5% over the preceding year. Paint and varnish climbed 17.8%, while lacquer was up 20.5%. Trade sales, not up as much, nonetheless pushed ahead a significant 7.5%.

It's certain, too, that December sales put the industry over the $1.5-million mark for the first time in its history; and there are indications, say paint marketers, of further sales gains in 1956.

•

Synthetic fibers, too, are racking up new records, continue to nudge surplus-plagued cotton.

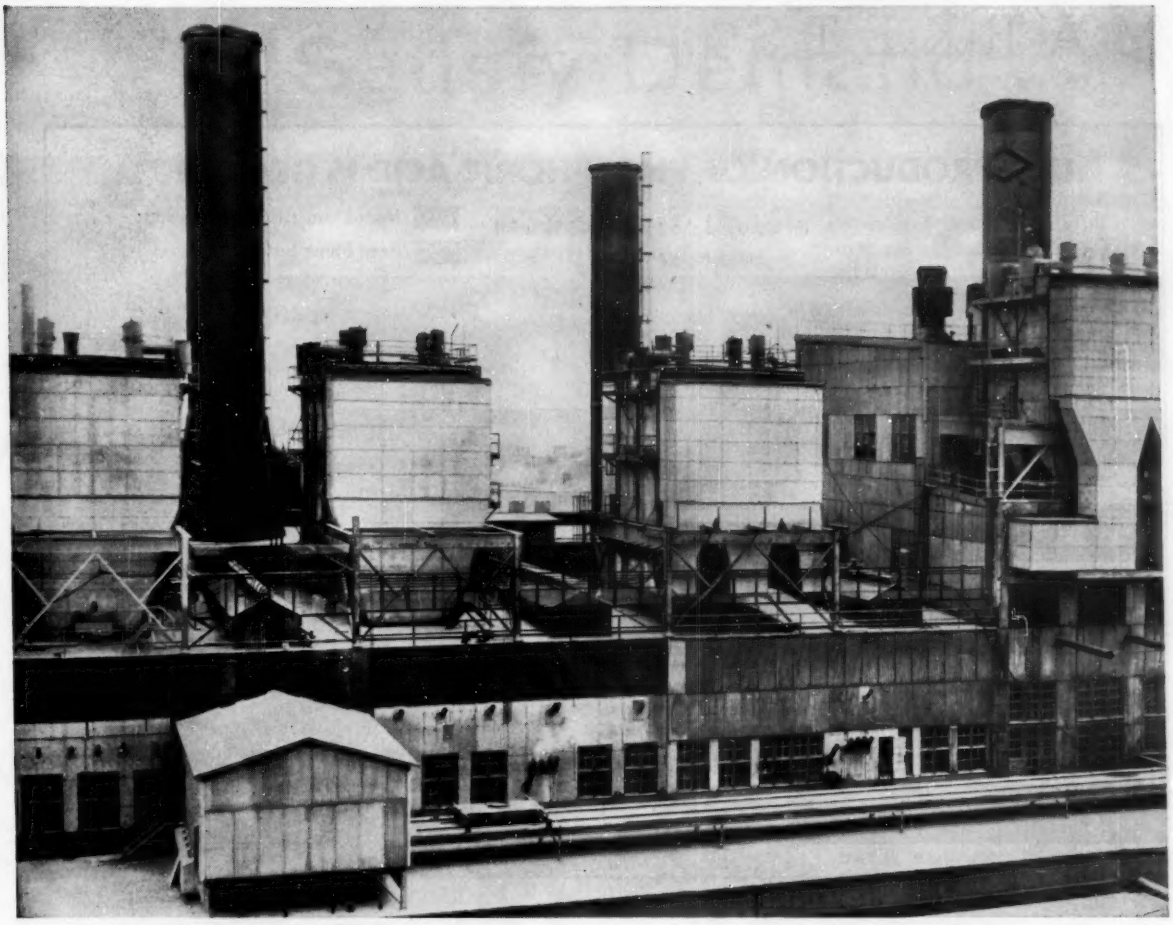
A supply of 25.9 million bales of cotton in the 1955-56 season, with an estimated disappearance of less than 12 million bales, will leave a record-high carry-over of about 14 million bales at the end of this marketing year. The decline of cotton consumption continues, despite last year's 1-lb./capita gain over the 1954 low of 25.4 lbs.

Demand for man-made fibers, in contrast, continues to increase. The '55 total consumption was about 11.2 lbs./capita, or 1.4 lbs. above the previous record high of 1950 and close to 2 lbs. above the 1954 figure.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending January 16, 1956

	Change	New Price
UP		
Molybdic acid, 85% dms., wks.	$0.03	$1.15
Sodium molybdate, anhyd., dms., dlvd.	0.03	0.88
DOWN		
Lead, metal pigs, prime, N. Y., St. Louis	0.005	0.16
Potassium stannate, dms., frt. alld. E.	0.08	0.728
Sodium stannate, dms., wks., frt. alld. E.	0.08	0.603
Stannous sulfate, dms., wks.	0.015	1.005
Tin, metal (Straits)	0.05	1.0575

All prices per pound unless quantity is stated.



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Air pollution from the power house is no longer a problem at the world's largest alkali manufacturing plant in Painesville, Ohio. Four Koppers Electrostatic Precipitators atop the boiler house roof at this huge Diamond Alkali plant remove 95% to 97% of the dust normally discharged from the boiler plant stacks.

These Koppers Electrostatic Precipitators went into operation in 1954. Previously, the four plant boilers which vary in capacities—fired with pulverized fuel—had created a nuisance with stack gases containing a high fly ash content. Today, the four Koppers units with a total capacity of over 700,000 cubic feet per minute, trap and remove this fly ash, storing it in collecting hoppers before it is sluiced away to a waste lake.

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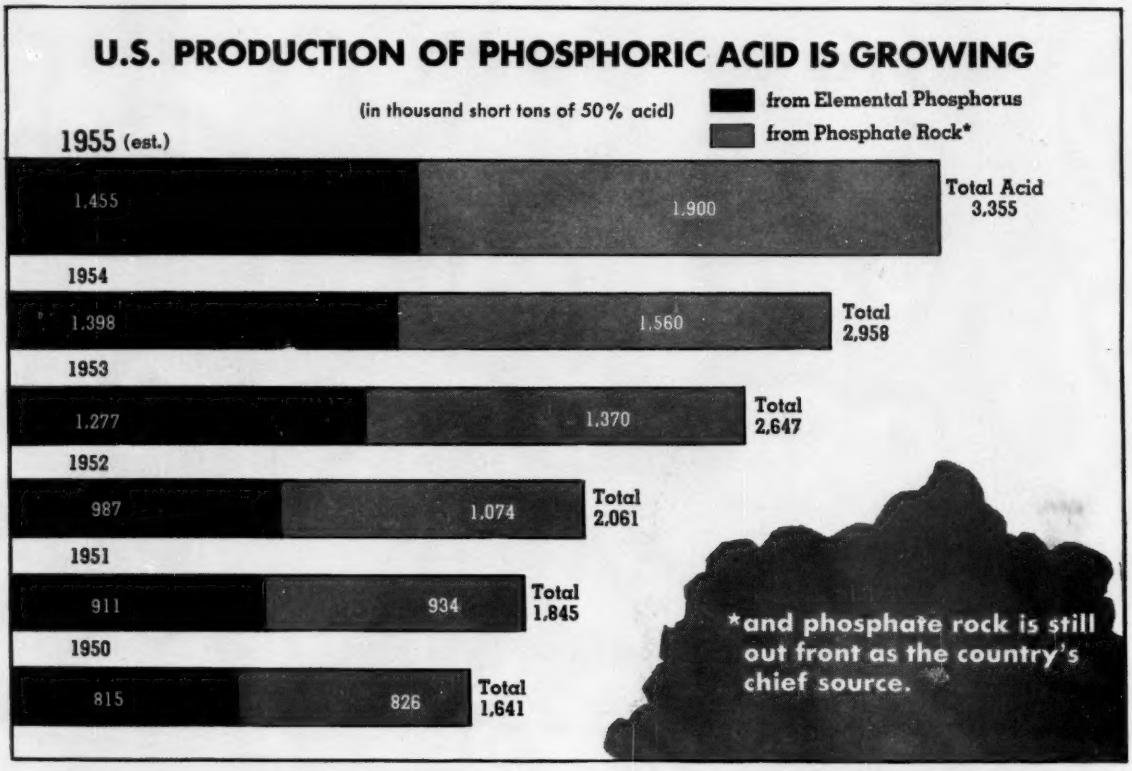


Phosphoric Acid: Behemoth on the Move

U.S. phosphoric acid production will reach toward a 3.8-million-ton mark this year—topping a five year output-doubling that put '55 at near 3.4 million.

Another possible '56 development: newer acid applications may well highlight elemental phosphorus sources.

U.S. phosphoric acid production leaped a full 1.7 million tons in five years, scored a spectacular 3.4-million-ton record output in 1955. Over-all growth of the industry will probably continue unchecked; but this year may mark the beginning of a new and more intensive competitive phase between producers of wet-process and furnace-process acids.

Wet-process output—because of the enormous fertilizer demand—has held a sizable and growing edge on furnace acid. In 1950, for example, its total production of 826,000 tons exceeded furnace output by 11,000 tons; by 1955, a 1.9-million-ton tally was 445,000 ahead of furnace production.

Uses of phosphoric acid are legion, of course, and the product of each source enjoys certain special markets without much competition from the other. Agricultural uses, e.g., fertilizers, are the forte of wet-process acid; many industrial uses (e.g., metal treating) now fall to furnace phosphoric.

But the lines of demarcation in some areas are growing less distinct as both types of producers look beyond traditional market boundaries, make ready to browse in adjacent pastures.

Furnace acid will still find its most lucrative markets in industry: metal treaters expect huge growth, food and beverage processors will continue as major customers.

However, 1956 will see a concerted effort by furnace acid producers to invade the fertilizer market. This move has been long delayed, they say, because wider profit margins have made industrial outlets more worthy of primary development; but now farm demand for phosphorus chemicals has grown to such proportions that relatively slim profit margins are no longer as discouraging.

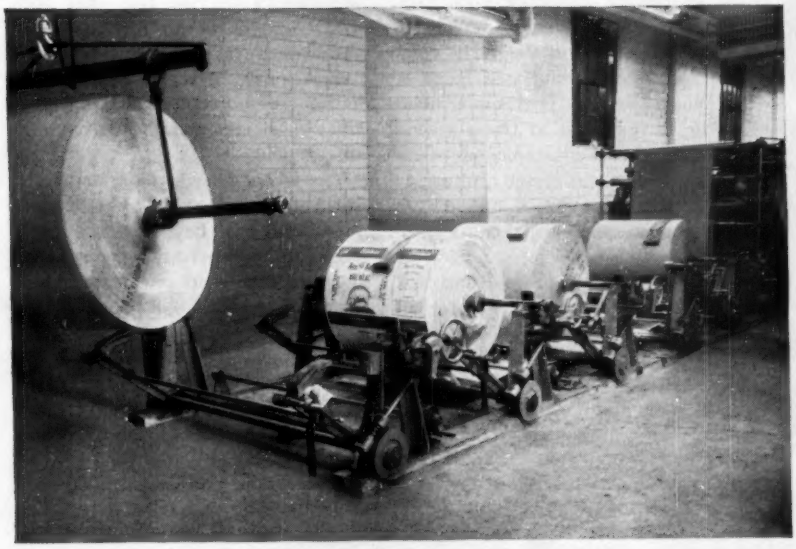
Meanwhile, wet-process producers are planning countermoves into animal feed supplements (with dicalcium phosphate)—a corner heretofore held by furnace-derived phosphate.

Bull Market: Much of the 170,000 tons of dicalcium phosphate produced last year went into animal feed, an outlet that, superficially at least, appears to be due for a steady increase.

But furnace phosphoric, too, is

*All phosphoric acid is derived from phosphate rock, of course. In the furnace process, however, phosphorus is first freed into the elemental form, which then readily reacts to form high-purity phosphoric acid. Wet-process phosphoric is made more directly by treating the rock with sulfuric acid; but the product usually needs further purification if intended for industrial uses or animal feeds.

To Satisfy Demand . . .



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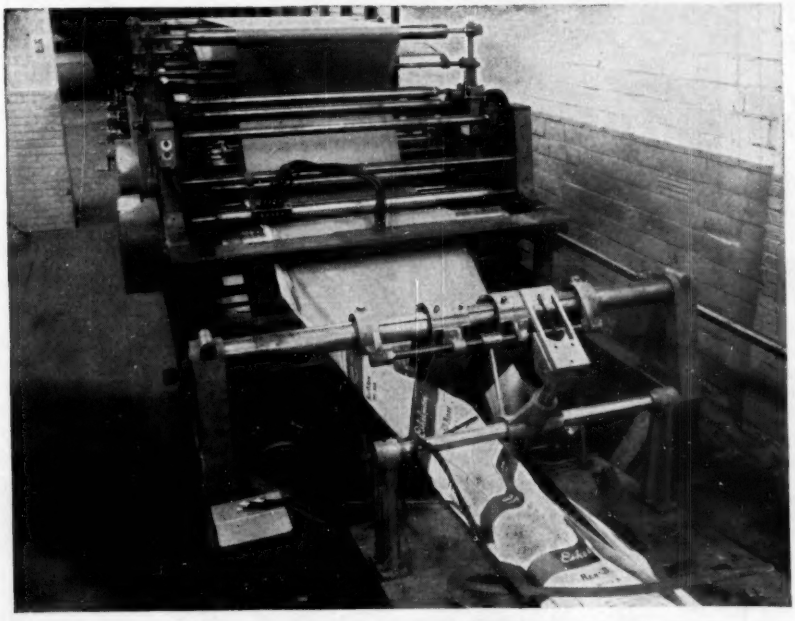

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heading for the cattle feed trough. The question is, will it add to the total phosphorus used in feeds, or will it merely replace dicalcium phosphate?

Some observers state flatly that phosphoric acid will definitely compete with the calcium salt. Sales of phosphoric acid as feed supplements in '56 are expected to reach several million pounds—an auspicious beginning for a new phosphoric acid use.

Other experts, however, on the basis of intensive experimental work (admittedly not yet conclusive), indicate that the acid and the calcium salt serve different purposes, hence are not necessarily competitive. The theory: dicalcium phosphate helps the animal grow better bones; phosphoric acid, on the other hand, whets the animal's appetite, adds more meat on the bones.

Further complicating the cattle feed controversy is an invasion of the feed-grade dicalcium phosphate market by producers of wet-process phosphoric acid. Electric-furnace-derived acid—because it's fluorine free—has been the traditional starting material. Now, however, Texas City Chemical and International Minerals say they've solved the problem of making feed-grade dicalcium phosphate from wet-process acid.

The whole situation is in a state of flux, and the only safe bet is that more phosphorus will be going into cattle feed. But it's anybody's guess which chemical—the acid or the salt—will ultimately corral a bull's share of the market.

Soil Soak-up: Hardly less controversial is direct application of phosphoric acid for crop fertilization; but in this case, crux of the debate is geographic.

Bulk of the estimated 20,000 tons

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Acid Value	197 — 202	197 — 202
% F.F.A. as Oleic Acid	99 min.	99 min.
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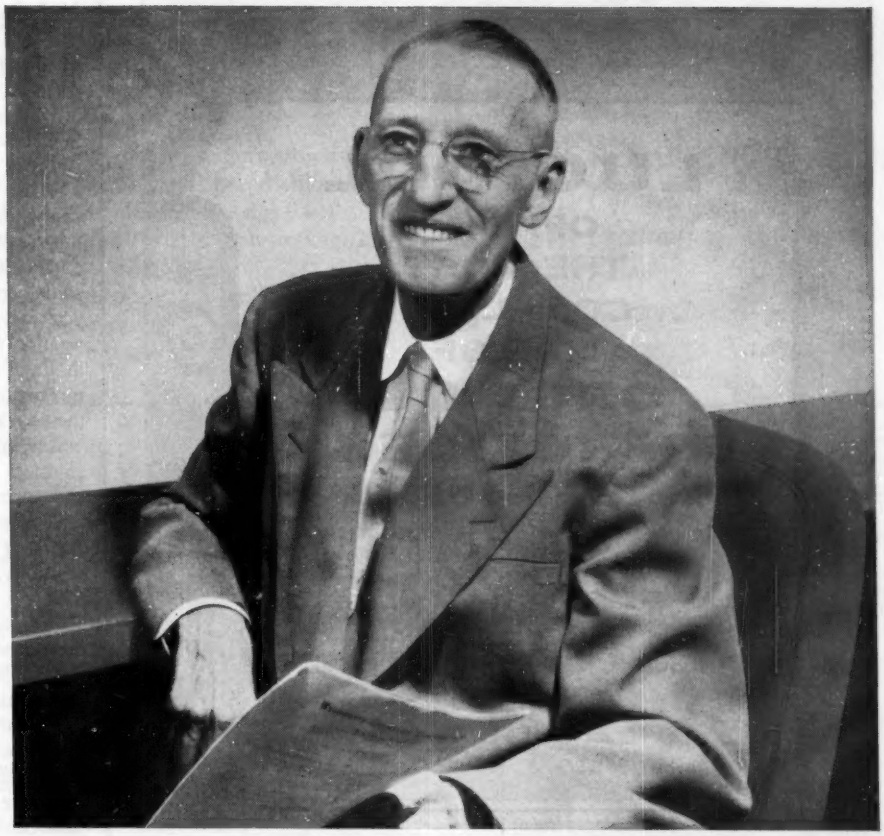
The translucent, nonshattering film is being used to build simple but effective plastic greenhouses. And, according to the Federal Extension Service of USDA, even do-it-yourself gardeners can put up "hothouses" at very low cost.

A structure 18x84 ft., utilizing a double layer of polyethylene, costs about $200 (excluding labor). Breakdown: about $50 for the plastic; $150 for framework, doors and laths. Cost of materials for a conventional glass structure of the same size: about $4,000.

Dependable Source for Chemical Raw Materials



Wetalene's President W. J. Mangold bases his business on quality products.

"Wyandotte's Pluronics help us keep our quality high"

— W. J. Mangold, president, Wetalene Laboratories, Inc., Columbus, Ohio

"We have to make quality products to meet competition," says W. J. Mangold, president of Wetalene Laboratories, Inc. "That's why we're constantly looking for ways to improve our quality.

"When Wyandotte introduced the PLURONICS,* we recognized in them a balance of properties that was not available in other surfactants. We thoroughly tested and evaluated those PLURONICS that had the greatest potential for us.

"We found that in *Only-Wun*, our complete compound for automatic washers, the PLURONICS gave us increased soil removal and whiteness retention, and enabled us to control the sudsing. The PLURONICS also produced a more free-flowing product. In addition, we were able to eliminate some of the compounding operations required with our previous nonionic, with resultant labor and equipment savings.

"In addition to the PLURONICS, we also use Wyandotte KREELON* CD and CARBOSE.* We have found Wyandotte products quite compatible, not only with each other, but with all products compounded with them.

"We also appreciate the service behind these products. When we need additional materials, we can schedule our production on Wyandotte's word that the materials will be here."

Have you looked into the possibilities of the PLURONICS in *your* business? The PLURONICS have already been used successfully in many fields: viscose rayon and cellophane, metal cleaning, boiler descalants, mechanical dishwashing, and dye leveling — to name a few. Our experience in these and many other fields is at your command. Just write us, giving details of your expected applications. We'll send you pertinent data and samples for your evaluation. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in principal cities.*

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of phosphoric acid used during the 1954-55 season was spread over Western fields; over 8,000 tons were used in California, the rest mostly in Texas, Arizona, Utah and Nevada.

These areas, some marketers steadfastly insist, will continue to provide the really important fertilizer acid outlets. The reason: liquid phosphoric acid can be applied more readily where it can first be dissolved in irrigation waters. An added sales point in the Far West is the acid's ability to neutralize highly alkaline soil, thereby improving tillability.

But equally emphatic are those who envision the Midwest as the coming big-tonnage area. Some 100 plants have already been built—or are being built—to provide complete fertilizer solutions for Midwest farms. The products will contain phosphoric acid that has been reacted with ammonia to form ammonium phosphate.

Combined growth of direct application in the two areas will, of course, determine the total effect on phosphoric acid consumption. But another puzzle—and it's a big one—is the inevitable competition with triple superphosphates, the big outlet for wet-process acid.

Adding further to the confusion will be the government's proposed handling of the farm economic crisis. If the Administration's new soil bank proposals are put into practice, and huge acreage cutbacks are made, the fertilizer industry will have new problems.

In some cases—tobacco, for example—such cutbacks would almost certainly slash fertilizer consumption. But in grain producing regions farmers may resort to heavier applications of fertilizer in attempts to get bigger yields per acre. How the total fertilizer consumption will balance out is anybody's guess.

But though there are problems, and competition will be sharper, trade consensus is that these should not be construed as cause for alarm.

Supply/demand outlook for the coming year is very healthy. Recent plant expansions are being justified by vigorously growing markets, and chances are that output of plants on the way will be absorbed readily.

All in all, the phosphoric acid industry—because of its enormous size and highly diversified markets—should have little trouble with temporary setbacks or competitive strains.

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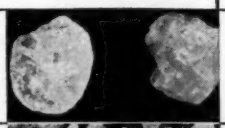
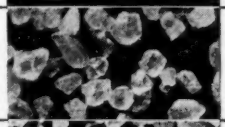
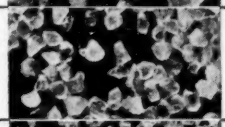
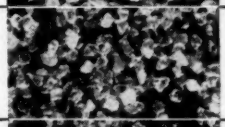
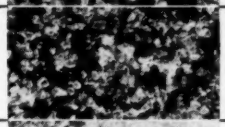
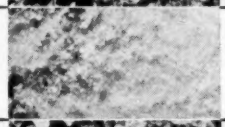
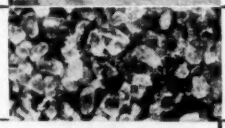
PEA No. 1 Repackage these big sparkling PARADI crystals just as they come from the drum.					
PEA No. 2 A popular size for repackaging in vaporizer cans.					
RICE No. 1 Smallest crystals recommended for direct repackaging. Excellent for shaker-top cans.					
RICE No. 2 Exceptionally free-flowing, easy packing, for fast refilling of power presses.					
RICE No. 3 For foot-operated presses you need a finer crystal like this—free-flowing but small enough to pack and compress easily.					
POWDERED Save time in melting and molding with this super-fine fast-melting size.					
GRANULATED Sell this size in bulk for agricultural use.					
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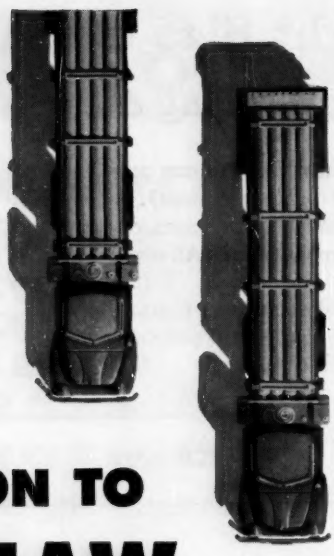

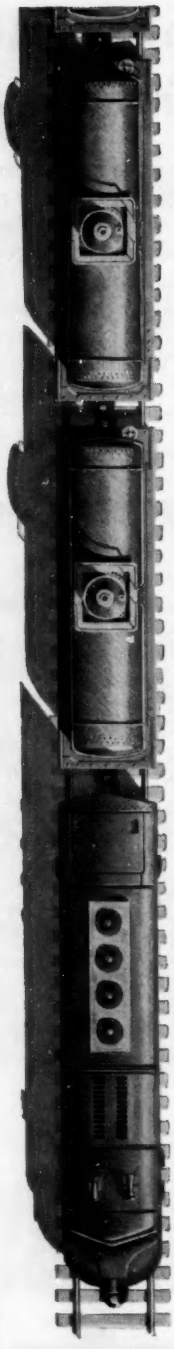

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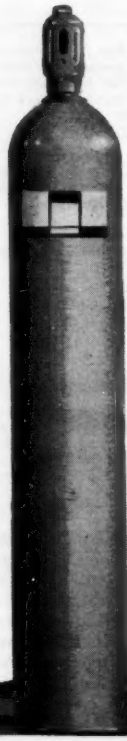
Hydrofluoric Acid Aqueous
Hydrofluosilicic Acid
Lead Fluoborate
Metallic Fluoborates
Potassium Bifluoride
Potassium Chromium Fluoride
Potassium Fluoborate
Potassium Fluoride
Potassium Titanium Fluoride
Silico Fluorides
Sodium Fluoborate
Tin Fluoborate
Zinc Fluoborate
Zinc Fluoride



WRITE FOR

Harshaw's 40-page Book on Hydrofluoric Acid Anhydrous. It provides helpful data.

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Technology

Newsletter

CHEMICAL WEEK
January 21, 1956

Another acetylene-from-natural-gas plant is in the offing as Rohm & Haas this week pushes ahead with plans to make its own acetylene for production of acrylates at Deer Park, Tex. The firm is keeping quiet about the entire project; it's still in an early stage.

But the way it looks at the moment, the company will build a Sachse acetylene plant, use the tail gas for its proposed ammonia plant at that site (*CW Business Newsletter, Jan. 14*). The scale of production has not been determined, but it will probably be a $10-million plant making something like 20 million lbs./year of acetylene.

Although it's doubtful that any contracts have been let, the acetylene portion will probably go to Chemical Construction (which prefers to tag the process as the Badische), while Girdler is the trade's nomination for the ammonia builder. L'Aire Liquide is the likely supplier of the oxygen plant.

In any case, Rohm & Haas was bound to emerge as an acetylene producer sooner or later. It's now paying a rather heavy freight penalty to ship calcium carbide from Pryor, Okla. (Midwest Carbide). And that doesn't square with its avowed intention to drop acrylates prices, broaden their scope of application. In fact, Rohm & Haas has been talking about captive production of acetylene ever since it switched raw materials (from ethylene) a couple of years back (*CW, Feb. 14, '53, p. 44*).

What's been holding Rohm & Haas back all along has been the scale of production. Its present acetylene needs are probably in the neighborhood of 10 million lbs./year. Foreseeable expansion of acrylate capacity could easily push that to the 20-million-lbs./year figure. But even that has been considered small for an economic natural gas acetylene plant.

So don't rule out the possibility that Rohm & Haas' acetylene production may eventually turn out to rival that of Monsanto's or Cyanamid's, which is more than double what Rohm & Haas had been considering. It's been no secret that Rohm & Haas has been talking to Diamond Alkali about supplying that firm with acetylene for a vinyl chloride plant. At present, Diamond uses ethylene for its vinyl production, says that it is completely happy with the process. But though it emphasizes that it has made no commitment with Rohm & Haas to take any acetylene, don't be surprised to see just that take place.

If the plans go through, then, Rohm & Haas will follow in the footsteps of other natural gas acetylene producers—Carbide and Monsanto at Texas City and American Cyanamid at Fortier, La. The first two oxidize natural gas with oxygen to get acetylene, use the tail gas—essentially a synthesis gas—to make methanol. (Monsanto's methanol is a joint venture with Heyden.) Cyanamid—as Rohm & Haas would do in its proposed installation—oxidizes the synthesis gas further with steam to get more hydrogen. And that reacts with nitrogen to produce ammonia. Nitrogen comes from the air separation plant, which produces oxygen for the oxidation to acetylene.

•

Stauffer Chemical is putting the finishing touches on a new benzene hexachloride process in a 3,000-lbs./day pilot plant at Torrance, Calif. Main feature of the process is increased yield of gamma isomer, the only one that has insecticidal activity.

Stauffer has been able to obtain yields as high as 29% with the new process. The average has been running 26-27%, slightly more than double the 12-13% yields the company has achieved with other approaches. Key to

this improved performance is something of which the firm is both proud and secretive; the new process employs standard unit operations, says Stauffer, "significantly different operating variables." Normal method of making BHC is to chlorinate benzene in the presence of actinic light.

Others, of course, also see room for improvement in BHC production methods. Columbia-Southern, for one, is working on such a project. And work at the University of Michigan indicates that radioactivity might be put to good use in benzene chlorinations (*CW, Dec. 3, '55, p. 58*).

•

Time is running out, and M. W. Kellogg has not yet made up its mind about what to do with the Oregon Products Lab process to extract wax from fir bark. High-level conferences on the subject (*CW Technology Newsletter, Dec. 31, '55*) apparently reached an impasse at the research level. But the option runs out this month, so a decision is necessary either to renew or to give the Oregon State Forest Board a chance to consummate new royalty agreements.

•

If you've been counting on atomic power as a cheap source of energy, take a look at the figures put out by the Atomic Industrial Forum this week in its monthly memo. At an unclassified meeting attended by only "senior executives in industry," it reports, Admiral Rickover dropped a bombshell in the form of some cost figures on the 60,000-kw. demonstration reactor at Shippingport, Pa. Instead of the 7- to 9-mils/kwh. figures that have been bruited about, Rickover pegs the cost closer to 52 mils/kwh. Rickover explains, however, that the Shippingport reactor is designed to "advance nuclear power technology rather than for . . . immediate economic power generation." And, he told the industry people, the cost could drop to 39 mils. Later on, AEC plans to install an advanced 90,000-kw. core in the PWR, which should yield more reasonable (but still high) cost figures of 14 mils/kwh.

•

Two other developments in atomic energy that could have sharp repercussions among chemical companies:

• The Dept. of Defense will, with AEC support, build a nuclear reactor to pilot-plant food preservation by radiation.

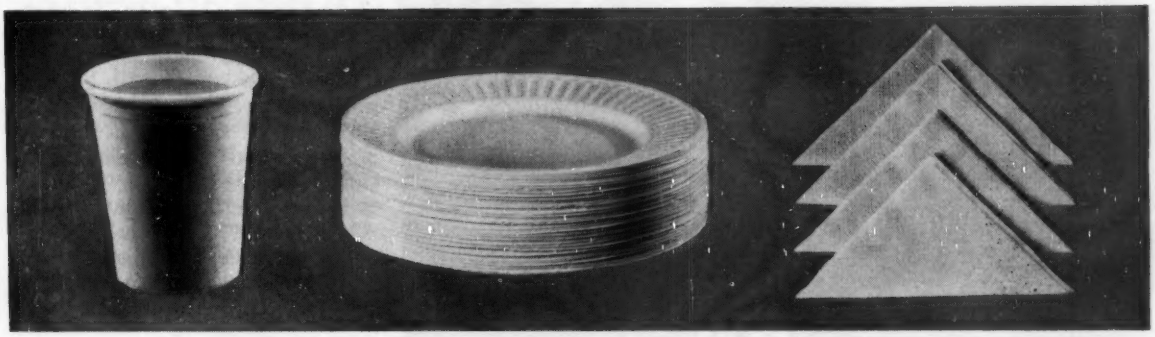
• Sequoia Process Co. (Redwood City, Calif.) is readying a radiation treatment for plastic wire coating. The product, according to the company, looks so good that the electrical industry will forget other insulators, including new and highly touted 125 C polyvinyl chloride coatings (*CW, Jan. 14, p. 42*).

The company is sitting tight on product and process details, won't even identify the plastic being used. It does say that it is not polyethylene, vinyl or Teflon fluoroplastic (leaving Mylar terephthalate a possibility). The resin is modified by what Sequoia describes as a simple processing step—application to the wire, passage through a General Electric 1-mev. electron beam generator having a 1-kw. beam output.

•

Now there's scientific evidence to support the thesis that perspiration makes a pretty fair sun tan lotion. Research in Prague, Czechoslovakia, indicates that considerable amounts of urocanic acid—imidazolineacrylic acid—occur in human perspiration. The chemical is a strong absorber of ultraviolet light, may be as good as or better than commercial preparations. Its natural occurrence suggests that it's probably nontoxic.

BAGS OR BOXES, CUPS OR CARTONS,



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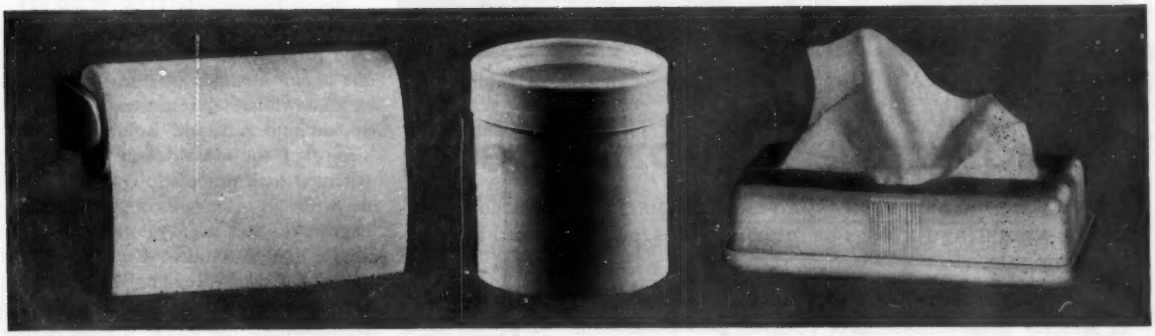

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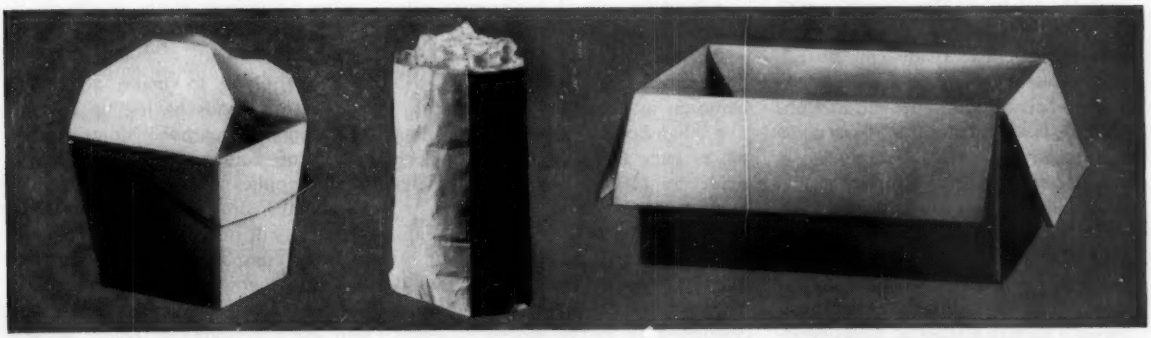

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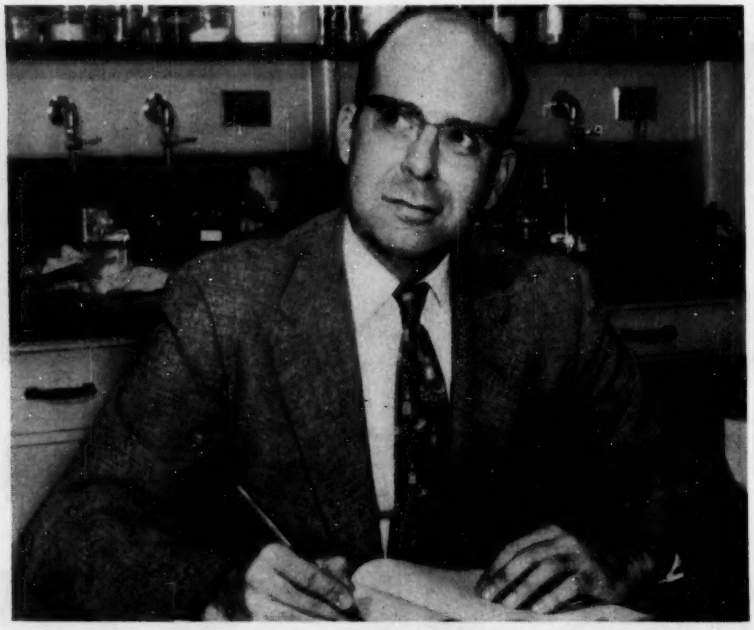

BECCO'S GREENSPAN: His tyro epoxies are looking for a future.

Sire of a New Epoxy Breed

Three new epoxy compounds, launched by Becco Chemical, are pointing for uses as intermediates, solvents, and specialty chemicals.

Their entry signals Becco's departure from its position as strictly a raw materials (peroxygen chemicals) supplier to a maker of epoxies.

This week, Becco Chemical (Buffalo), division of Food Machinery and Chemical Corp., broadened its role in the industry, expanded its list of products — peroxygen chemicals — to include relatively long-chain epoxidized olefins. Still developmental, they are octylene oxide (mixed 1,2- and 2,3-epoxyoctane); C_{16}-C_{18} olefin oxide (mixed 1,2-epoxyhexadecane and 1,2-epoxyoctadecane); and dodecane oxide (1,2-epoxydodecane).

Already under evaluation by several companies, the newcomers bear a pilot-plant price tag (still unsettled), feature an ability to couple long-chain hydrocarbons, reportedly show potential as:

- Intermediates in organic synthesis; e.g., preparation of glycol derivatives such as ethanolamines, esters and sulfates.
- Plasticizers, synthetic lubricants, surface-active agents, corrosion inhibitors, and modified alkyd and polyester resins.
- Stabilizers of chlorinated products (resins, solvents, insecticides and paraffins).
- Reactive solvents for epoxy resins. During curing, the compounds react with epoxy resin curing agents (e.g., polyamines or acid anhydrides) to become an integral part of the resin.
- High-boiling solvents. Boiling points vary from 76 C for octylene oxide to 110 C for C_{16}-C_{18} olefin oxide.

Introduction of the compounds caps a history of epoxidation research by Becco. Originally, the company sought new uses for its hydrogen peroxide, developed an epoxy process utilizing a preformed peracid. Late last year, the firm's organic research manager Frank Greenspan and chemist Ralph Gall worked out an *in situ* expendable ion-exchange resin epoxy process (*CW, Nov. 12, '55, p. 68*). During the course of this research, the new compounds were turned up.

Basically, their manufacture involves stirring together a mixture of a straight-chain olefin (choice depends on final product desired), acetic acid, and a strong sulfonic acid type of cation-exchange resin (like Rohm & Haas' Amberlite IR-120 or Dow's Dowex 50X), then adding hydrogen peroxide. After cooling, the product is washed with water until free of acetic acid, dried, and filtered.

By a comparable older method, the olefin is mixed with peracetic acid (made from glacial acetic, sulfuric acids, and hydrogen peroxides). Anhydrous sodium acetate is first added to the peracetic in order to remove the sulfuric acid catalyst.

Becco has patents (U.S. 2,684,353 and 2,692, 271) on a preformed peracid process, has filed applications on the *in situ* method.

Meanwhile, others are pushing epoxidation research. Rohm & Haas, strong in the epoxidation field, has patented such processes. Du Pont sees its work as a means of broadening its market for peroxygen chemicals. And a spate of others—Dept. of Agriculture's Eastern Regional Laboratory (Philadelphia), General Mills, Archer-Daniels-Midland, Baker Castor Oil, and Colgate-Palmolive-Peet Co.— are busy with the epoxidation of fats.

Greenspan believes that this is the first time that olefin oxides made with hydrogen peroxide have been offered commercially. And although both processes noted above can be used, recent refinements in the *in situ* process are said to make it the more efficient.

Becco plans to make additional epoxy compounds having up to and including 20 carbon atoms. Such plans, of course, hinge on finding paying applications. Another possibility is that hydroxylation (by peracids) research will turn up new marketable hydroxy compounds. One reason for this thinking is that hydroxyacyloxy derivatives may be readily converted into the corresponding glycol by saponification with alkali. Whatever the outcome of such studies, epoxy makers as well as hydrogen peroxide producers are sure to be eyeing their progress.

Speedy Separator

As a means of analyzing hydrocarbons, chromatographic instruments are becoming increasingly popular. For the reason, consider Fisher Scientific's (Pittsburgh) new device (trademarked the Fisher-Gulf partitioner) for hydrocarbon separation and other complex analytical chores. Based on gas-liquid partition chromatography (see box), the apparatus quickly sorts gases and liquids whose similar boiling points tax the abilities of distillation columns.

Its entry tops off more than a year's research on the instrument at Gulf Oil Corp. (Pittsburgh) laboratories by analytical research director Norman Coggeshall, D. H. Lichtenfels, S. A. Fleck and F. H. Burow, further development by Fisher Scientific.

The newcomer will meet stiff competition from Perkin-Elmer Corp's (Norwalk, Conn.) Vapor Fractometer, Burrel Corp.'s* (Pittsburgh) Fracton and Kromo-Tog, and Podbielniak, Inc.'s (Chicago) Chromacon. And it's a good bet the field will grow even more competitive from here on in.

A catch-all term, chromatography covers a variety of analytical separations, all of which depend on differential sorption or solution of mixture components moving along a stationary medium. In hydrocarbon separation, this may involve: vapor-phase separation on composite partition columns (as in the Fisher-Gulf instrument); either liquid-phase or vapor-phase separation on solid absorption columns.

Reason for chromatography's popularity is embodied in its unusual talents. For example, the Fisher-Gulf partitioner not only identifies components in a mixture and measures their concentrations, but also permits their isolation.

What's more, the method requires only small samples. Unlike distillation methods, the chromatography apparatus doesn't form constant boiling mixtures that hinder separation. And in tough-to-winnow mixtures, such as blends of saturated and unsaturated C_5 hydrocarbons, separation can be accomplished in less than an hour—compared with days required for distillation. The Vapor Fractometer, for instance, reportedly sifts a mixture of 12 low-boiling hydrocarbons (methane, propane, iso-butylene, etc.) in 23 minutes.

Chromatography as a scientific tool goes back to 1906, when a Russian botanist named Tswett used adsorption to separate the coloring matters of leaves. In 1941, English researchers Martin and Synge suggested the possibility of separating volatile materials via columns on which the mixture's components would occupy a fixed position in the liquid phase but be moving in the gaseous phase. In the past few years, the technique has undergone intensive improvement.

Today, chromatography is finding application not only in quality control (e.g., for solvent impurities, petroleum products, perfumes, etc.), but also as a means of obtaining pure compounds needed for research. And the consensus of workers in the field is that new and wider uses are in the offing.

*In 1943, Burrel produced the first commercial adsorption fractionator specifically for the analysis of light hydrocarbon mixtures, supplied it to the U. S. government's Rubber Reserve Division for analyzing synthetic rubber intermediates.

PARTITIONER: For hydrocarbons, a short-cut to fractions.

How It Works

1. A small sample of the material to be analyzed is injected into a chromatographic column packed with diatomaceous earth particles, which are coated with a high-boiling organic liquid (e.g., dioctyl phthalate, tri-metacresyl phosphate, paraffin wax, etc.).

2. Each component of the mixture divides itself between a liquid phase which dissolves into the coating, and a gas phase in the spaces between the particles.

3. Individual components pass through the column at different rates depending on their "partition coefficients"—the ratio between the concentration of a component in the gas phase and its concentration in the liquid phase.

4. One by one, separated components are swept out of the column by a carrier gas (e.g., helium, nitrogen, or hydrogen) into . . .

5. A detecting device (conductivity cell) and measuring system. A change in composition causes an imbalance in the cell, which is recorded on a chart. Concentrations are calculated from the chart.

•

Antifungals: At Rutgers University College of Pharmacy (Newark, N.J.), 6-bromothymol and 6-iodothymol were recently prepared and compared for antifungal activity with the fungicides thymol and chlorothymol. In tests on 10 organisms, 6-iodothymol (0.05% in propylene glycol solution) was most effective of the four. Next best: 6-bromothymol.

•

Standard Exit: After June 30, the National Bureau of Standards (Washington, D. C.) intends to abandon master Saybolt viscometers as standards for the calibration of Saybolt Univer-

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sal and Saybolt Furol viscometers. Reason: the master instruments are found to be less precise than values obtained from mathematical conversion of kinematic viscosities to Saybolt. Conversion tables are available from American Society for Testing Materials (Philadelphia). The bureau says any objections to the proposed action should be brought to its attention.

•

Pressure Drop: Pronounced hypotensive effect (in animal trials) is claimed for several mono-acid esters of pentaerythritol trinitrate prepared at Lilly Research Laboratories (Indianapolis). The compounds, made by esterifying the nitrate alcohol with dibasic acid anhydrides, were evaluated as their highly soluble sodium salts.

•

Directory: Tentative publication date for the *Engineering Societies Directory* (price; $3.50) has been set for June 1. Questionnaires are being mailed to societies by the publisher, Engineers Joint Council (New York).

•

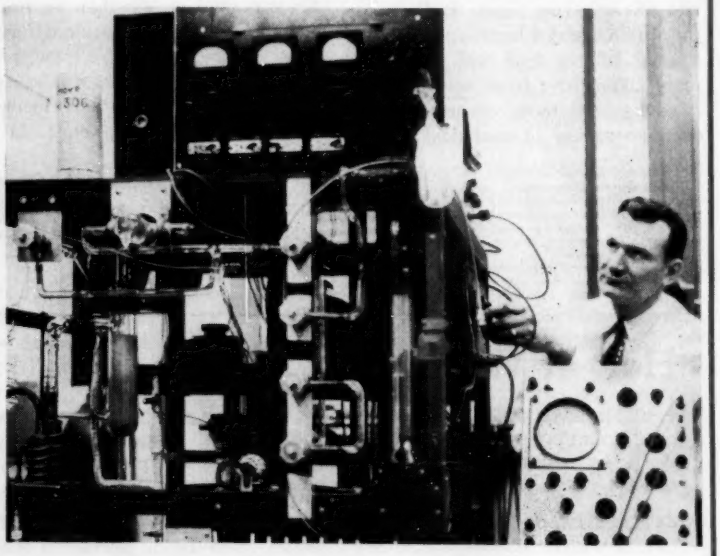
Rubber Synthesis: B. F. Goodrich Co. researchers recently turned up one of the few demonstrated instances of rubber synthesis by microorganisms: *cis*-polyisoprene was isolated and identified from benzene extracts of fungi of the genera *Lactorius* and *Peziza*.

•

Budding Compound: Recent studies reported by the Pineapple Research Institute's (Hawaii) Donald Gowing and Robert Leeper show that β-hydroxyethylhydrazine promotes the growth of pineapple flower buds.

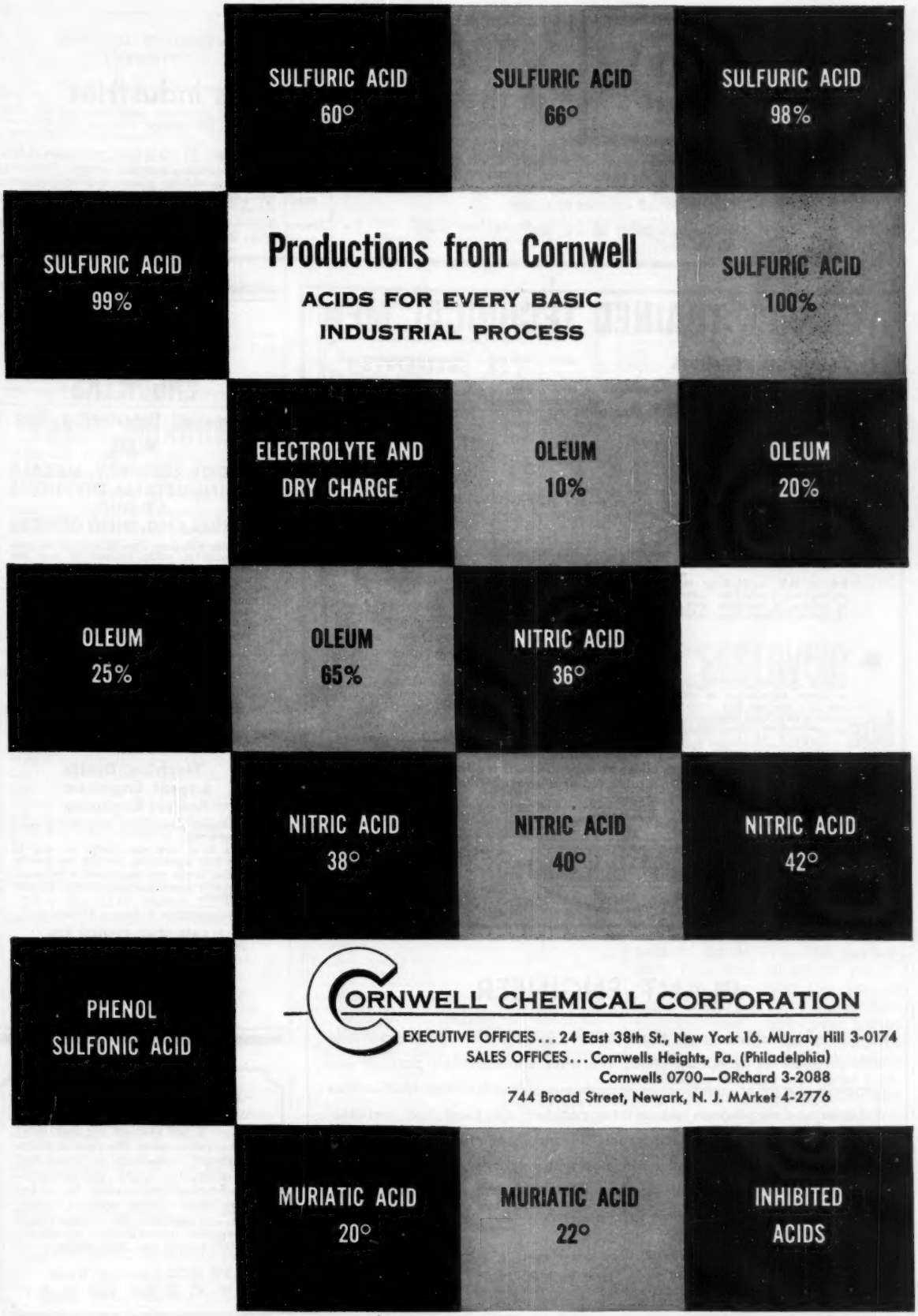
•

New Intermediate: For aldehyde syntheses, Haber Laboratories, Inc. (College Point, N.Y.) now offers N-methylformanilide in up to semicommercial quantities No solvents are usually required for its reaction with liquid or low-melting compounds. Price: $16/lb. (1-4 lbs.); $11/lb. (25-99 lbs.).



Hexafluoride Clue Seeker

SEEKING the theoretical reasons for sulfur hexafluoride's good insulating properties (reported to be 2 to 3 times that of air or nitrogen at the same pressure) is the job of Westinghouse Electric's (Pittsburgh) Russell Fox and his mass spectrometer (*above*). The instrument measures the compound's electron absorption, may provide clues to even better insulating gases. Because of high resistance to arcing, sulfur hexafluoride has been used in load-break switches.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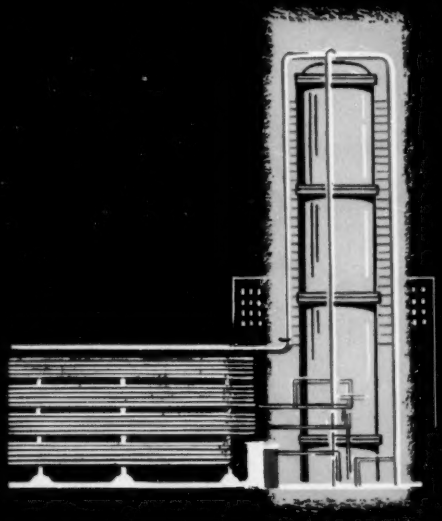

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